Mesh AP
802.11bg Mesh Outdoor AP

User Manual

Contents

Introduction **3**
Features **3**
Mesh Management Software **3**
Login Mesh AP **5**
Mesh AP Utility Manager **7**
Mesh AP Utility Manager Settings **9**
Mesh AP Web Setting **15**
1. Login Mesh AP 15
2. Configure AP+ Mesh Mode 17
3. Configure AP+STA (Repeater) Mode 23
4. Configure AP Mode 27

Set Mesh AP IP **33**
Set Login Password **34**
Backup & Restore **35**
Back to Factory Default **38**
Firmware Upgrade **39**
Change Mesh AP Name **42**
Mesh AP Status **43**
Troubleshooting **52**
Technical Specifications **53**

Introduction

Mesh AP can extend your existing network without any extra configuration and wiring.

Mesh AP supports [AP+Mesh], [AP+STA (Repeater)] and [AP] mode.

Features

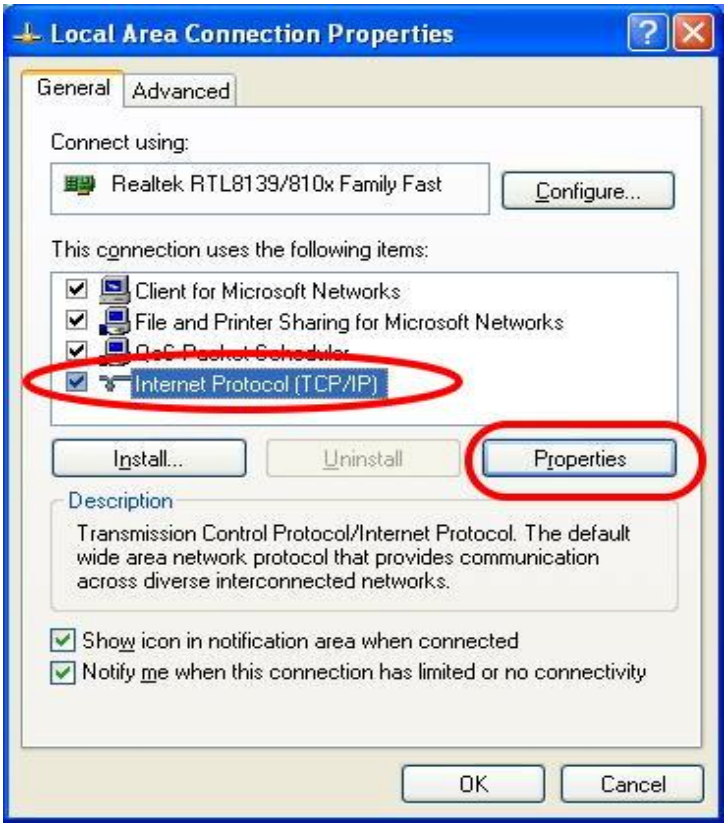
- Cost-Effective
- High Performance
- Easy for installation
- Auto connection for better signal route
- Easy to Configure by Mesh AP Utility Manager

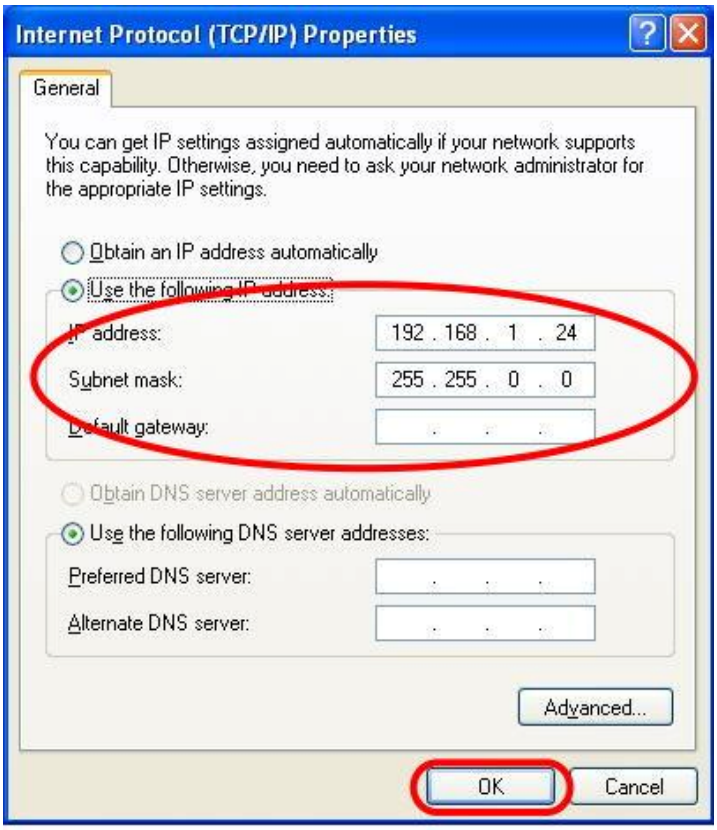
Mesh Management Software

- Mesh AP Utility Manager Version 1.0.7
- Search all Mesh AP automatically
- Configure one or all Mesh AP
- Display neighbor Mesh AP signal
- Auto-Refresh signal of Mesh AP
- Display Mesh AP network map

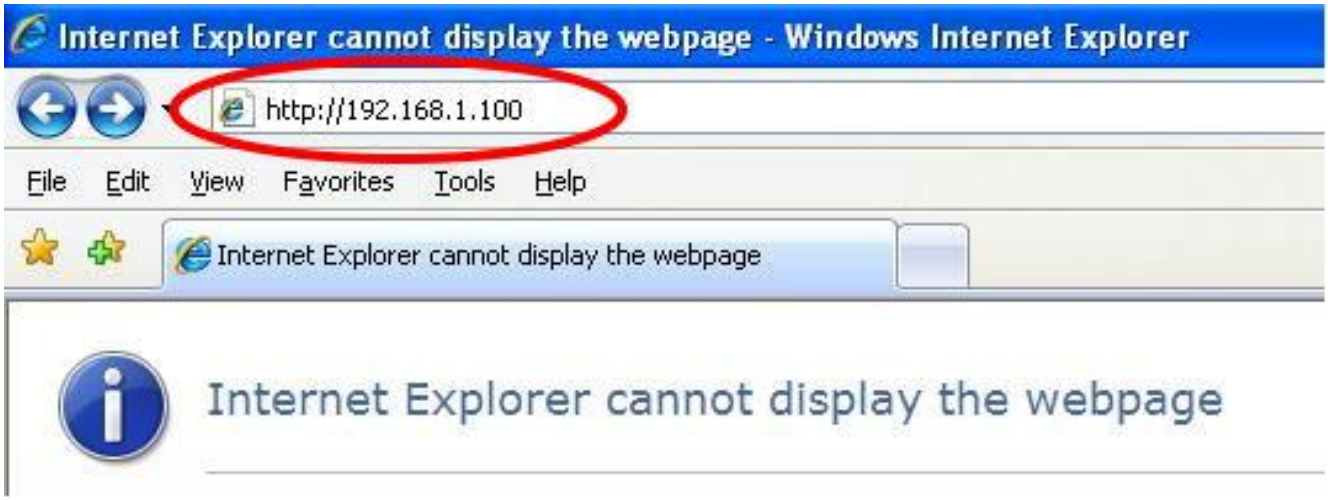
Login Mesh AP

1. Change IP Address on your PC



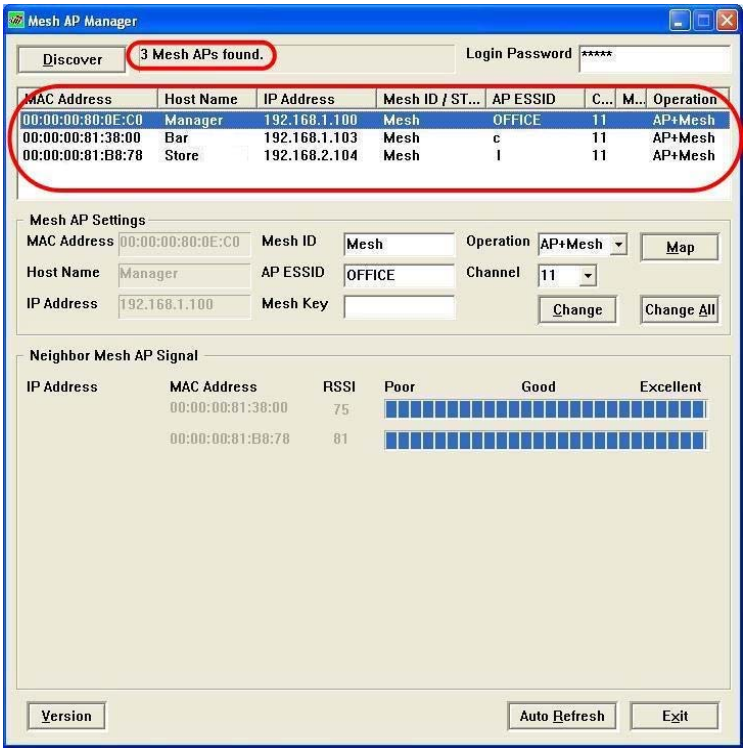

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 24
Subnet mask:
255 . 255 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

2. Run [Mesh AP Utility Manager] or enter the default IP (192.168.1.100) in web browser.

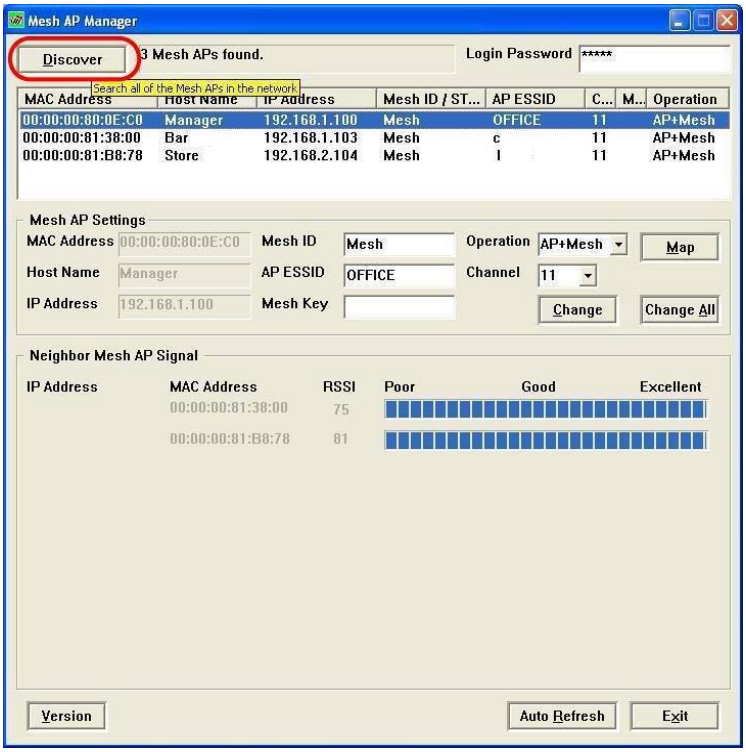

Internet Explorer cannot display the webpage - Windows Internet Explorer
http://192.168.1.100
File Edit View Favorites Tools Help
Internet Explorer cannot display the webpage
Internet Explorer cannot display the webpage

Mesh AP Utility Manager

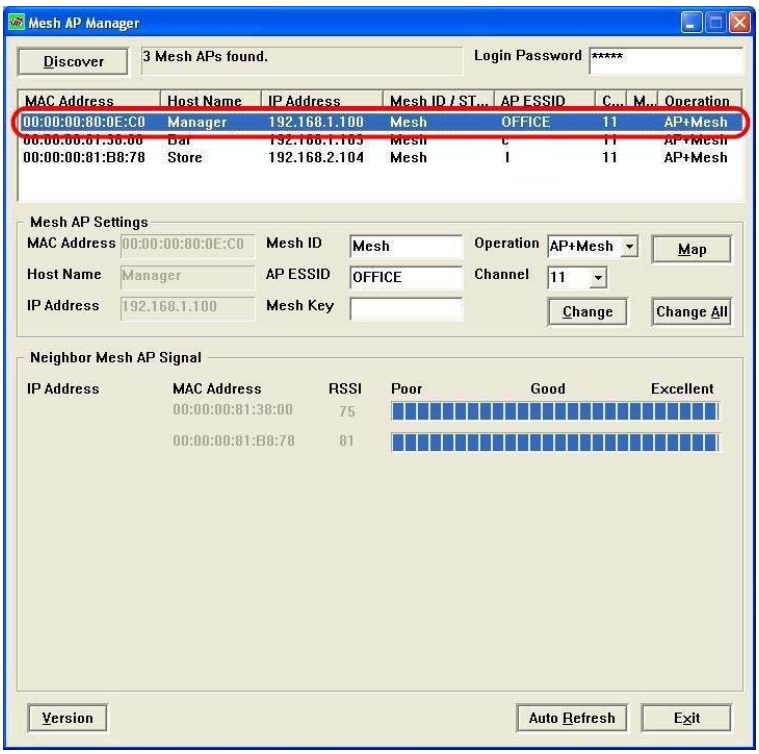
1. When start [Mesh AP Utility Manager], it will search all the Mesh AP in the network automatically.



2. Click [Discover] to search all the Mesh AP in the network.



3. Double-click the selected Mesh AP to setup Mesh AP via web browser.



4. Enter [User name] & [Password] to login the Mesh AP.

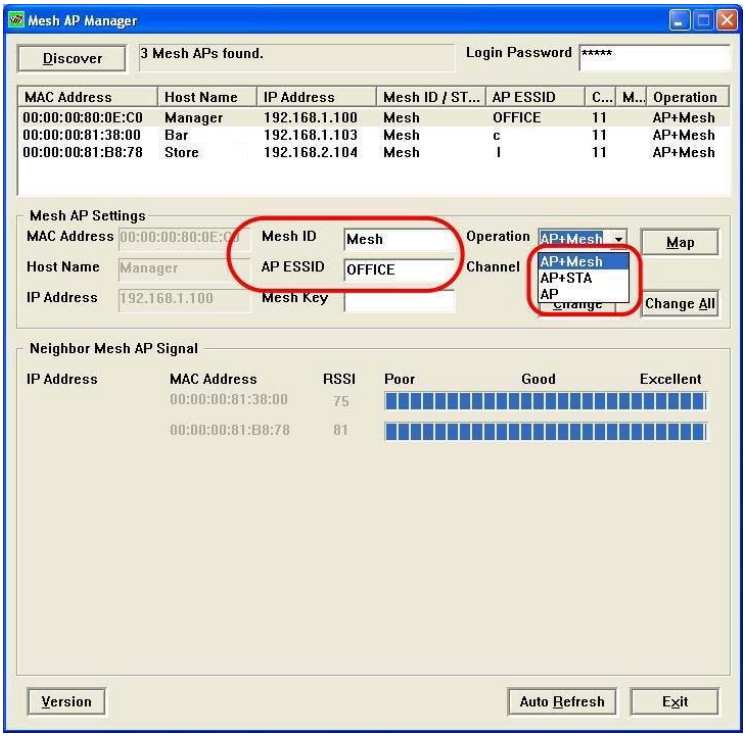
User name: admin or root
Password: admin

Connect to 192.168.1.100
The server 192.168.1.100 at Mesh requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
admin
Password:
Remember my password
OK
Cancel

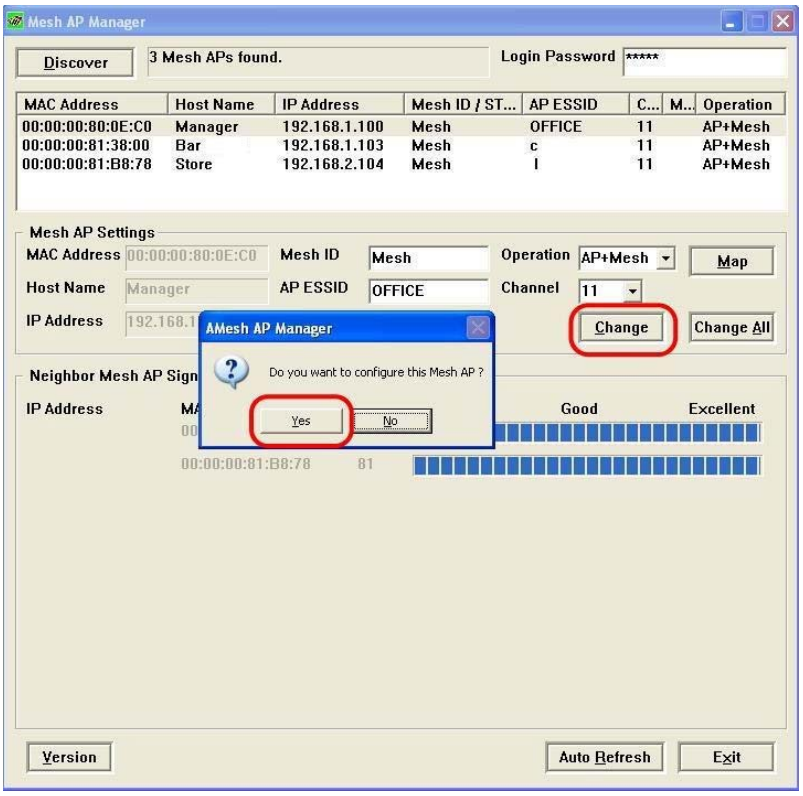
Mesh AP Utility Manager Settings

Mesh ID: Mesh network ID, 0-32 Bytes
STA ESSID: ESSID for [AP+STA] Mode only
Mesh Key: Encryption key between Mesh AP AP, 0-40 Bytes
AP ESSID: WiFi AP ESSID, 0-32 Bytes
RF Channel: [FCC] 1 – 11 Channel, [ETSI] 1 – 13 Channel
Operation: [AP+Mesh], [AP+STA] or [AP] Mode

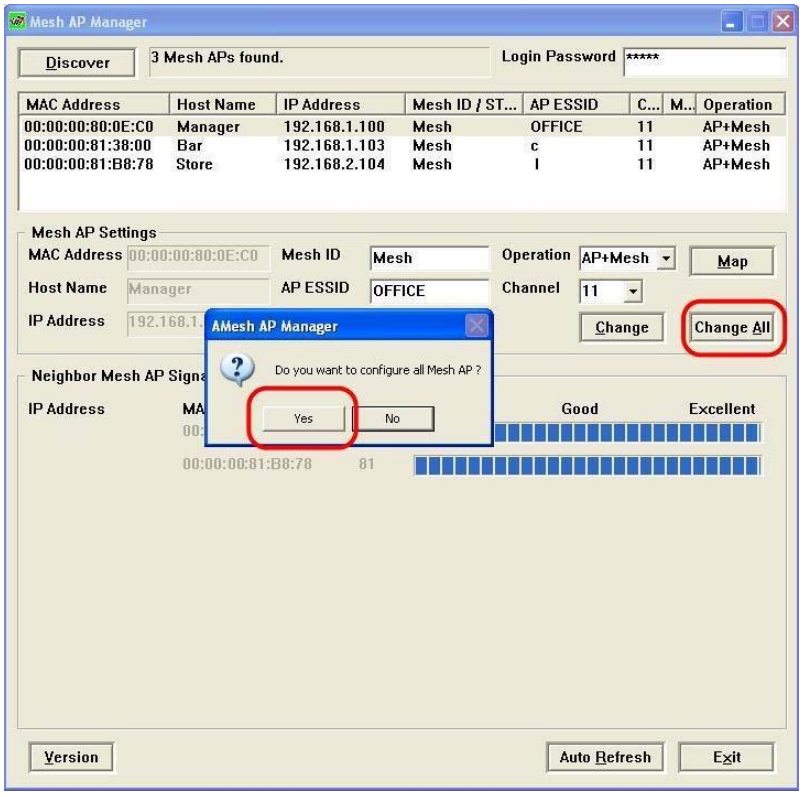
1. Click [Operation] to select different mode. [AP+Mesh], [AP+STA] or [AP] Mode.



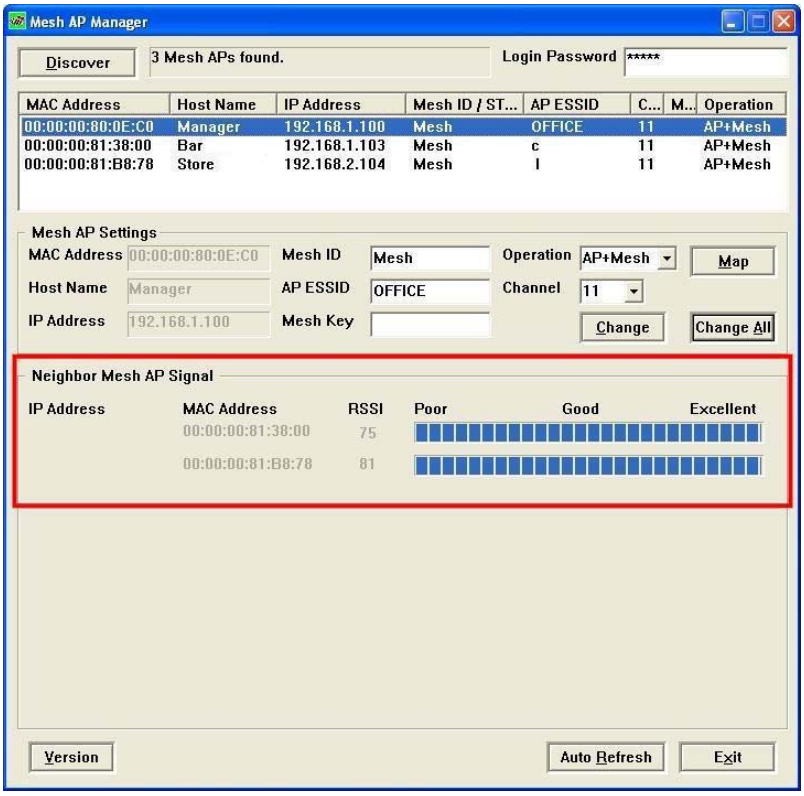
2. Click [Change] to update [Channel], [Mesh ID], [Mesh Key], [ESSID] and [Operation] for selected Mesh AP. Mesh AP will reboot automatically.



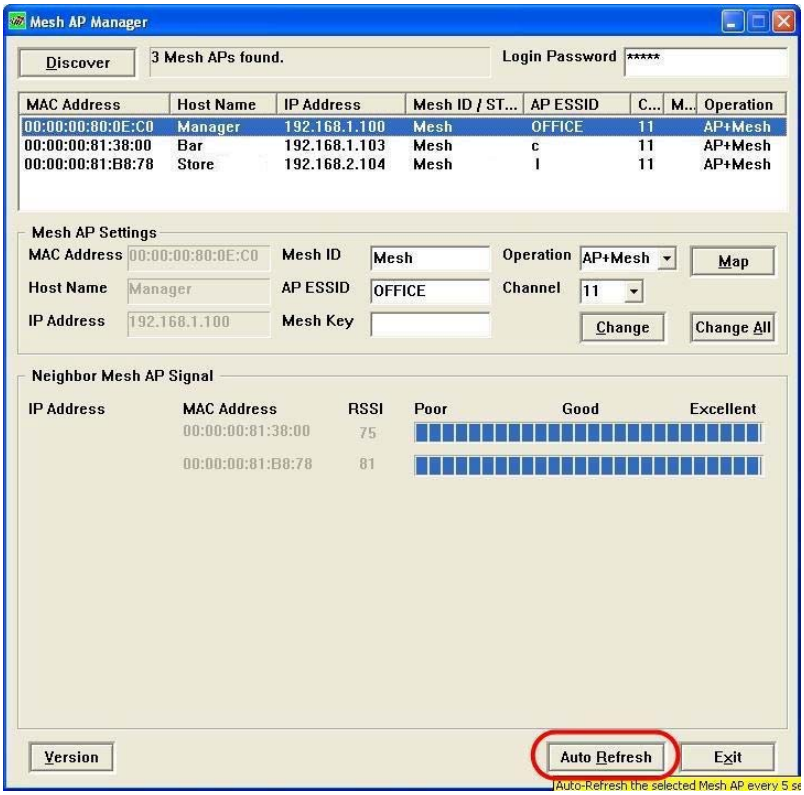
3. Click [Change All] to update [Channel], [Mesh ID] and [ESSID] for **ALL** the Mesh AP in the network, all Mesh AP will reboot automatically.



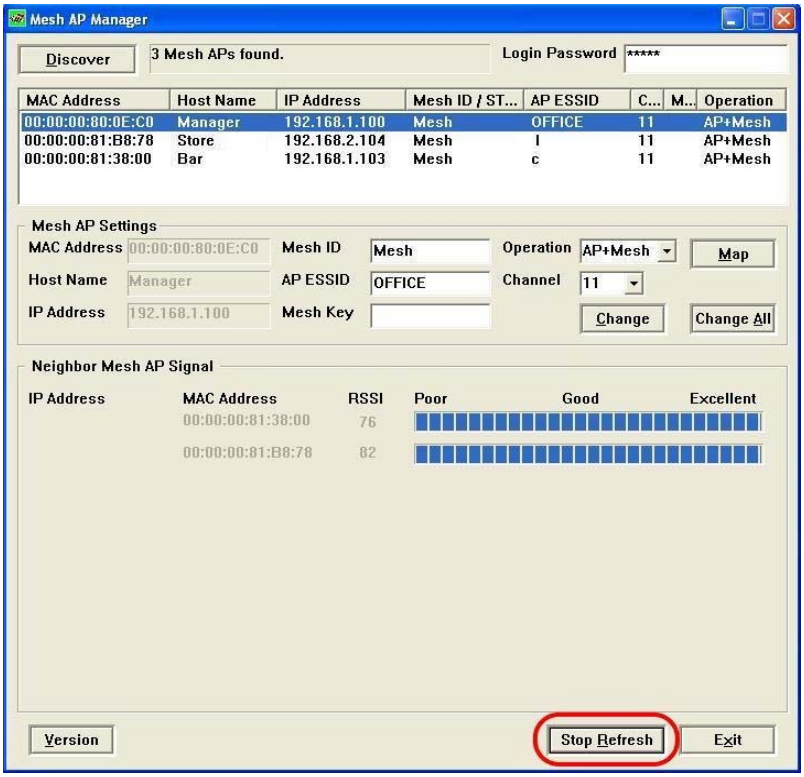
4. Select different Mesh AP in the list, it will display [Neighbor MESH AP Signal] for each Mesh AP.



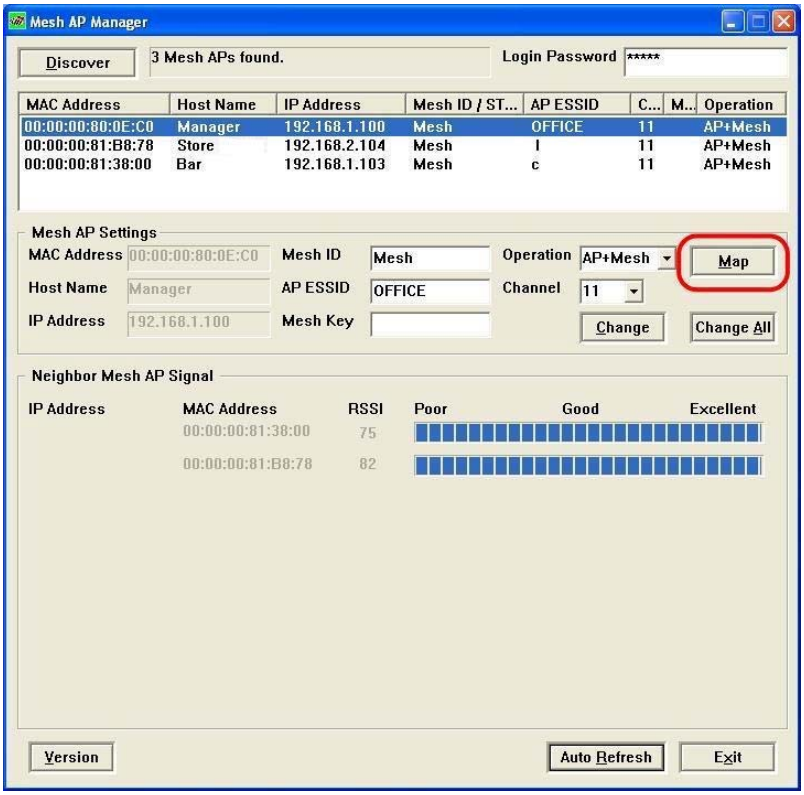
5. Click [Auto-Refresh] to refresh the selected Mesh AP information every 5 seconds.



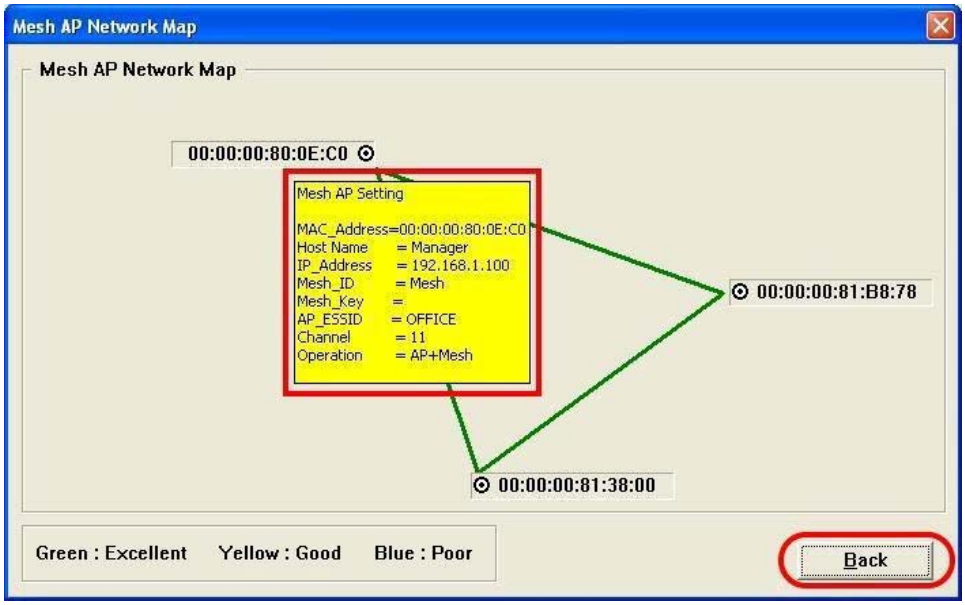
6. Click [Stop-Refresh] to stop.



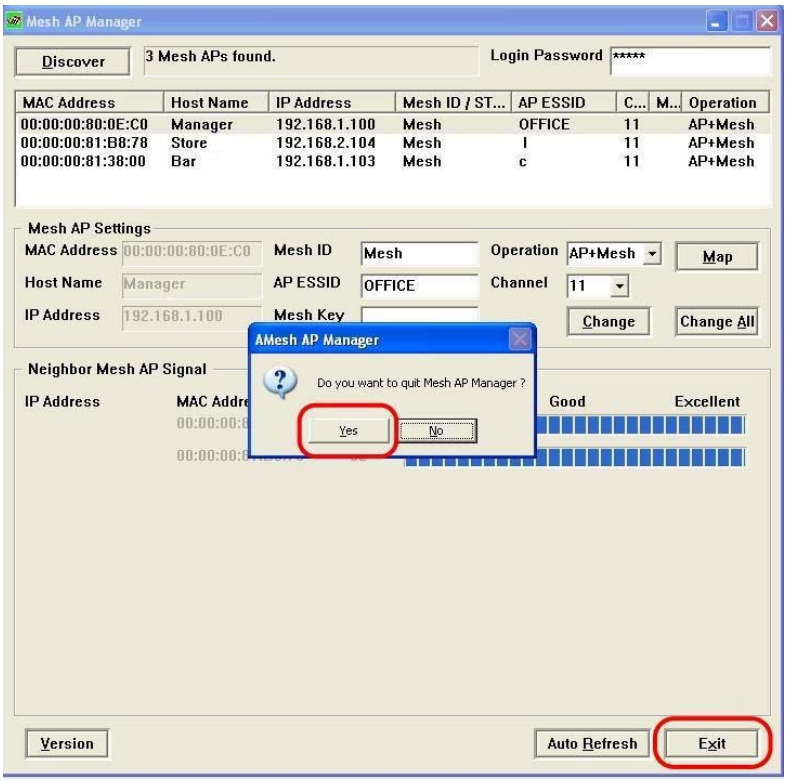
7. Click [Map] to show the network map.



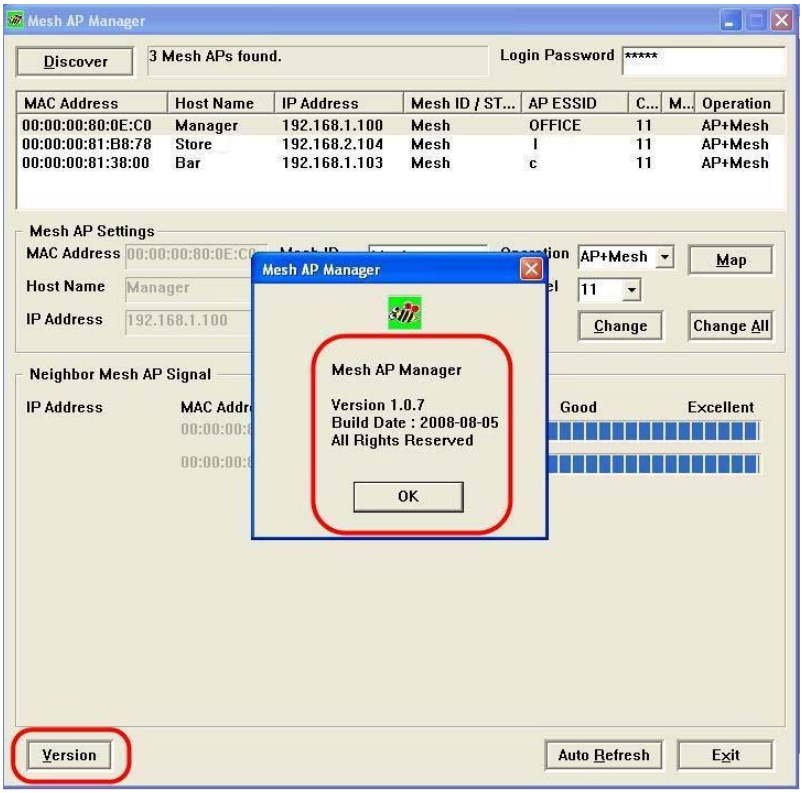
8. Move the cursor on the MAC address and it will display the Mesh AP settings. Click [Back] to close the map



9. Click [Exit] and [Yes] to quit [Mesh AP Utility Manager].



10. Click [Version] to see the software version of Mesh AP Utility Manager.

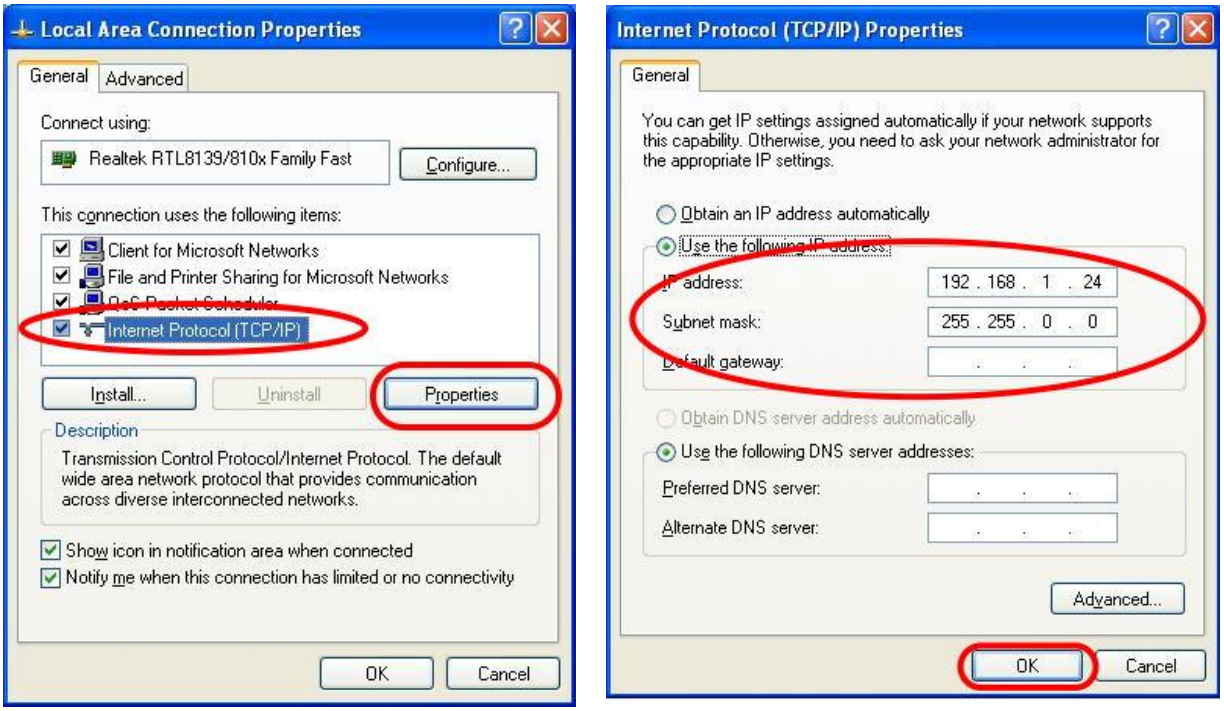


Mesh AP Web Setting

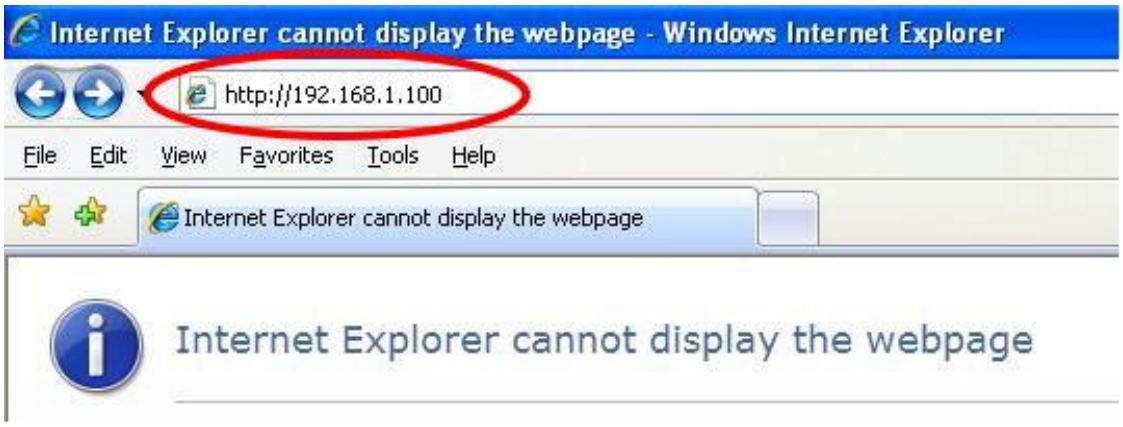
■rrMesh AP supports 3 modes: **[AP+Mesh], [AP+STA] (Repeater)** and **[AP Mode].**

1. Login Mesh AP

1-1. Change IP Address on your PC.


Local Area Connection Properties
General
Advanced
Connect using:
Realtek RTL8139/810x Family Fast
Configure...
This connection uses the following items:
Client for Microsoft Networks
File and Printer Sharing for Microsoft Networks
Internet Protocol (TCP/IP)
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Show icon in notification area when connected
Notify me when this connection has limited or no connectivity
OK
Cancel
Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 24
Subnet mask: 255 . 255 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

1-2. Enter the default IP (192.168.1.100) in web browser**.**

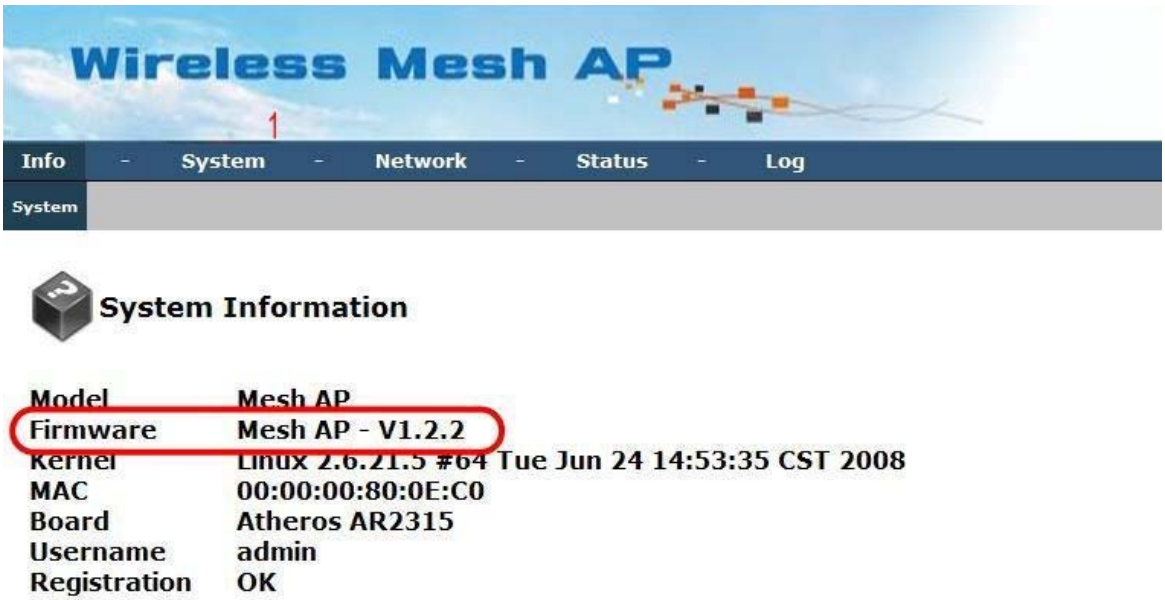

Internet Explorer cannot display the webpage - Windows Internet Explorer
http://192.168.1.100
File Edit View Favorites Tools Help
Internet Explorer cannot display the webpage
Internet Explorer cannot display the webpage

1-3. Enter [User Name] & [Password].

Connect to 192.168.1.100
The server 192.168.1.100 at Mesh requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
admin
Password:
Remember my password
OK
Cancel

User name: admin or root
Password: admin

1-4. ***Mesh AP*** configuration screen



2. Configure AP+ Mesh Mode

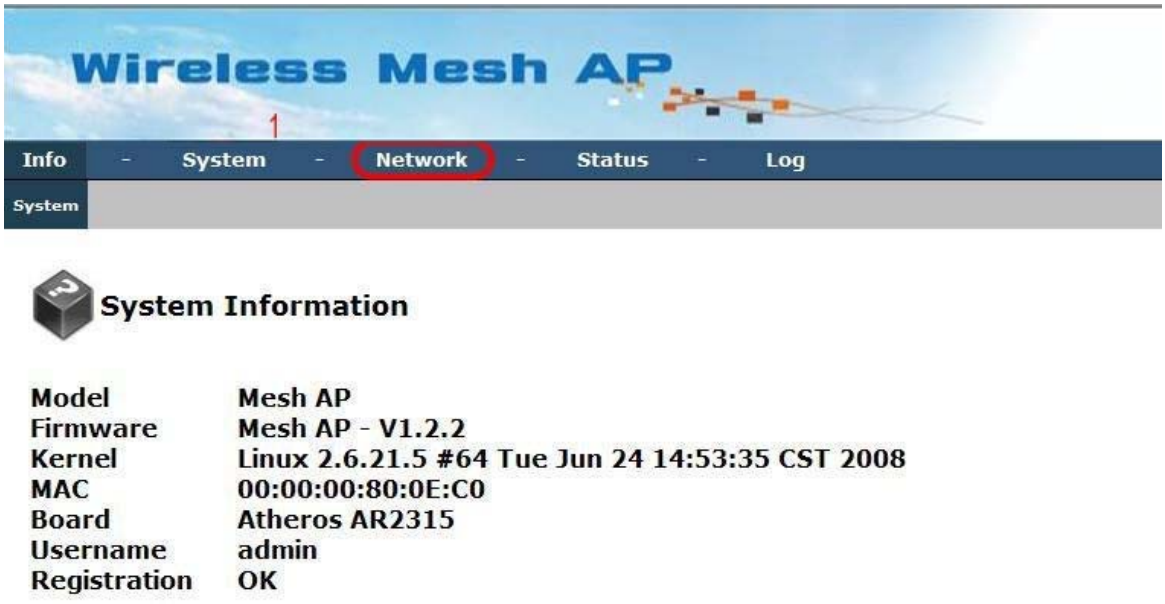
■ Default *Mode* : AP+Mesh

■ Default *Mesh ID* : Mesh

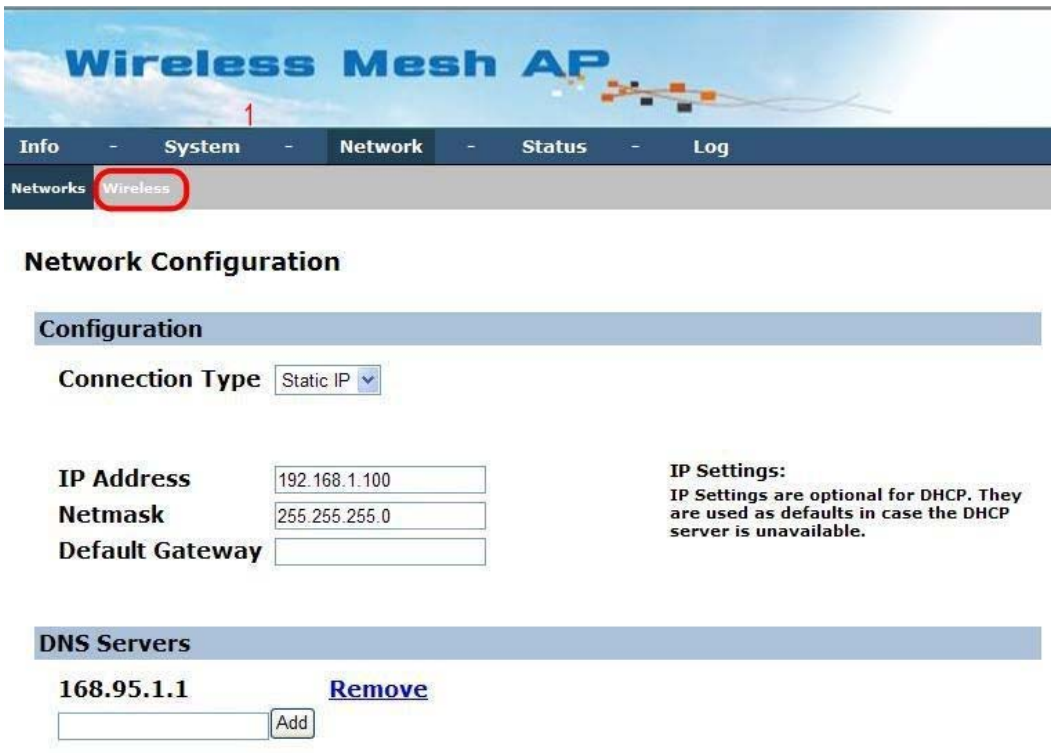
■ Default *Channel Domain* : FCC (Ch#1 – Ch#11)

■ Default *Channel* : 11

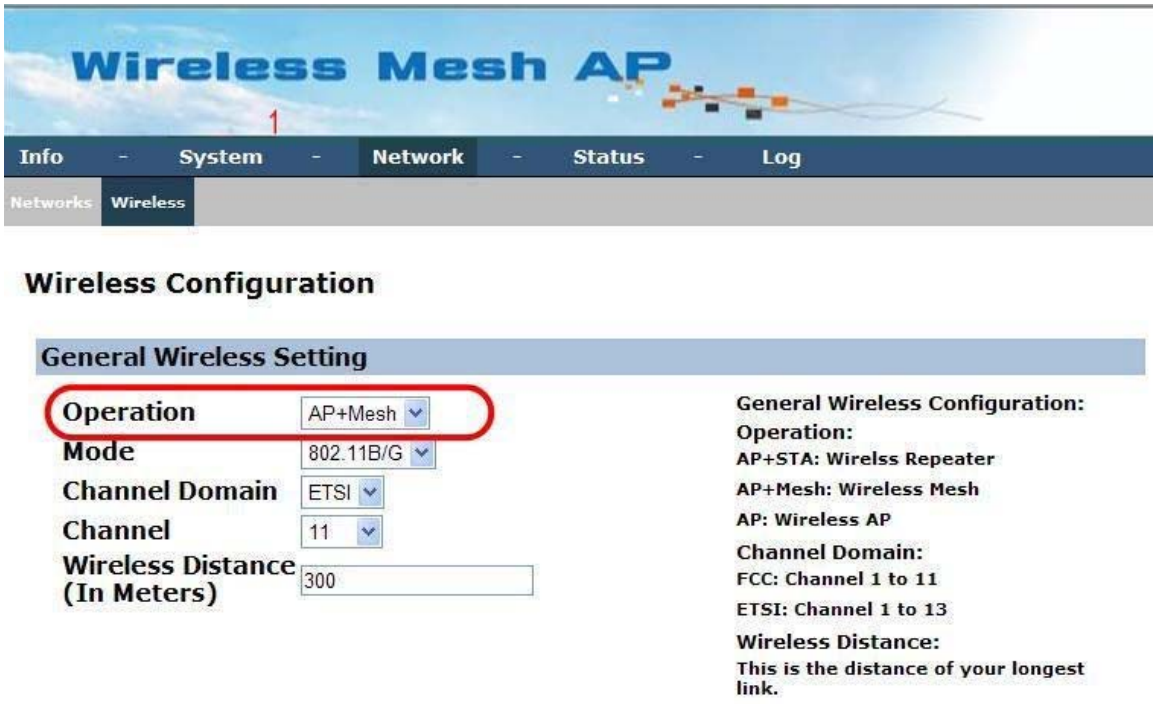
2-1. Click [Network].



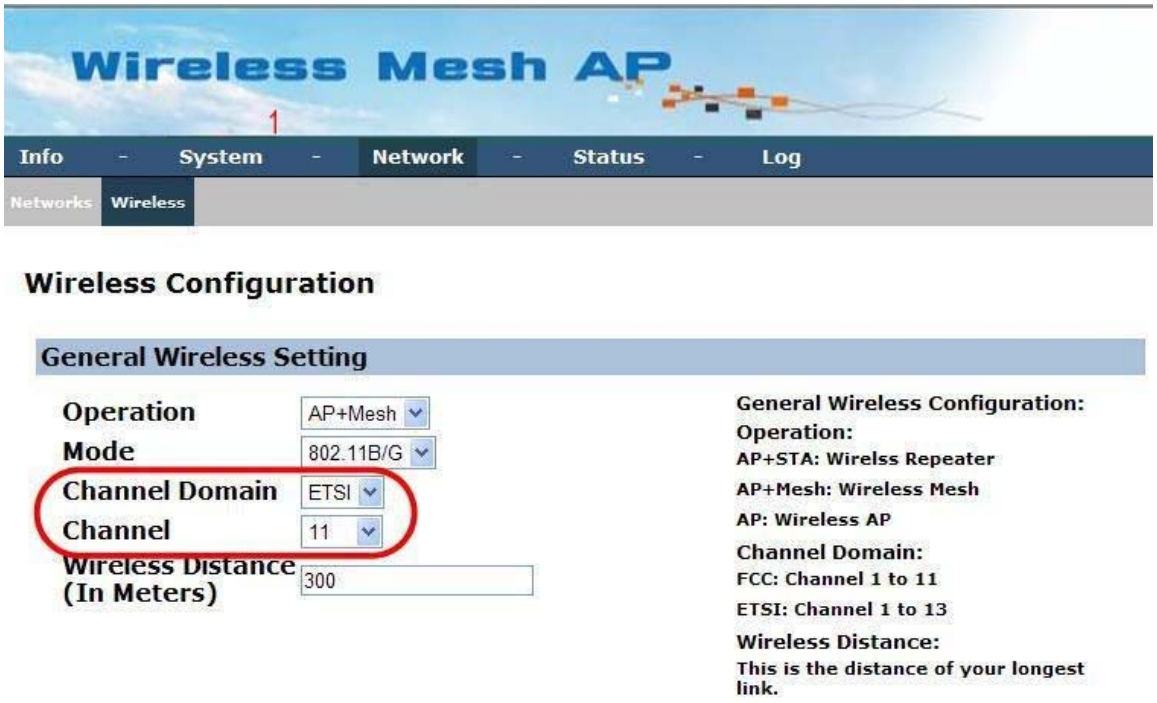
2-2. Click [Wireless].



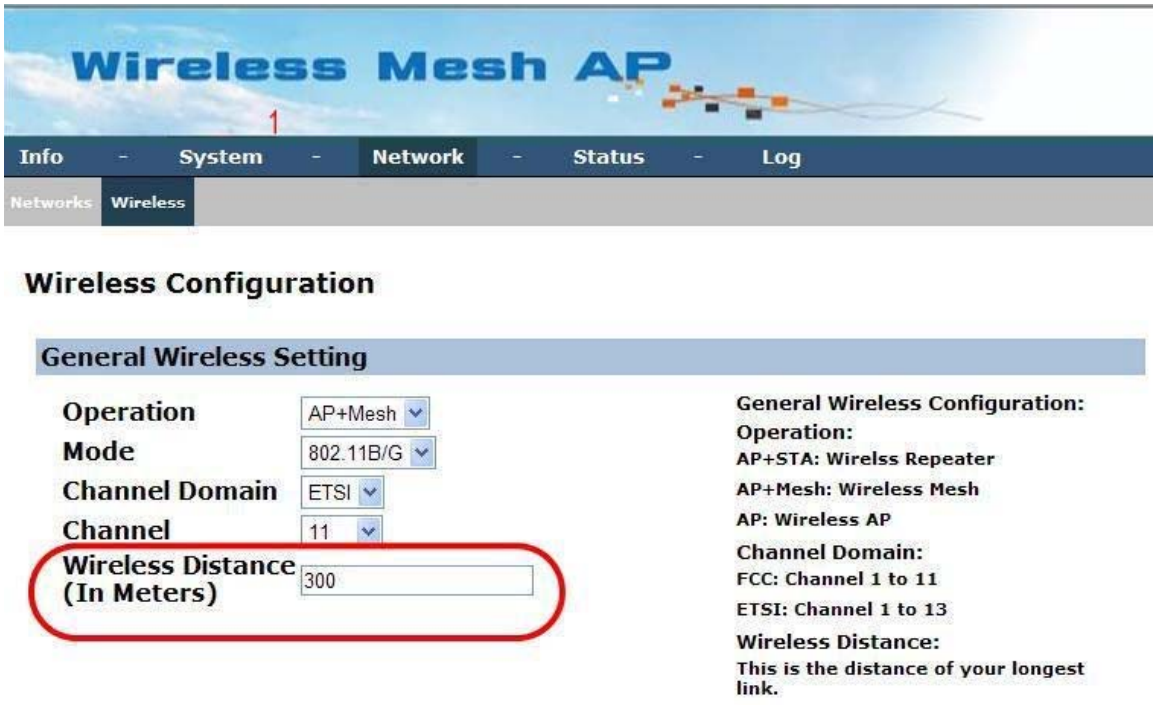
2-3. Click [AP+Mesh] in **Operation**.



2-4. Select desired setting for **Channel Domain & Channel**.



2-5. Enter the distance (in meters) of your application in **Wireless Distance**.

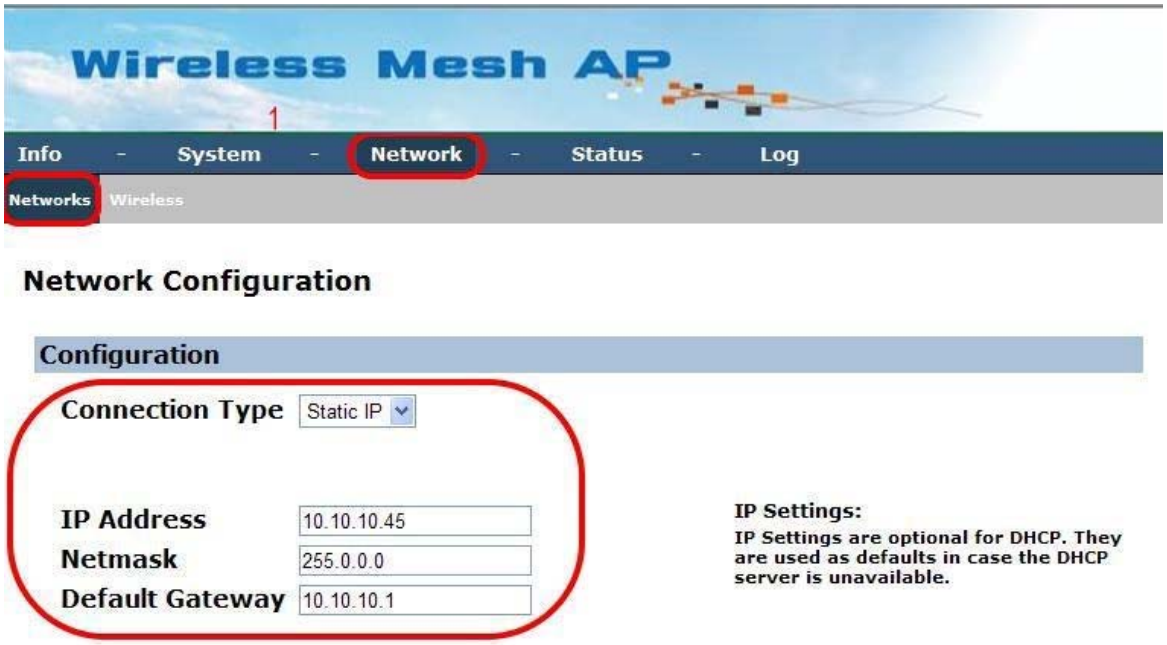


2-6. The default **MESH ID** is [MESH]. **MESH ID** is the same as **ESSID.**

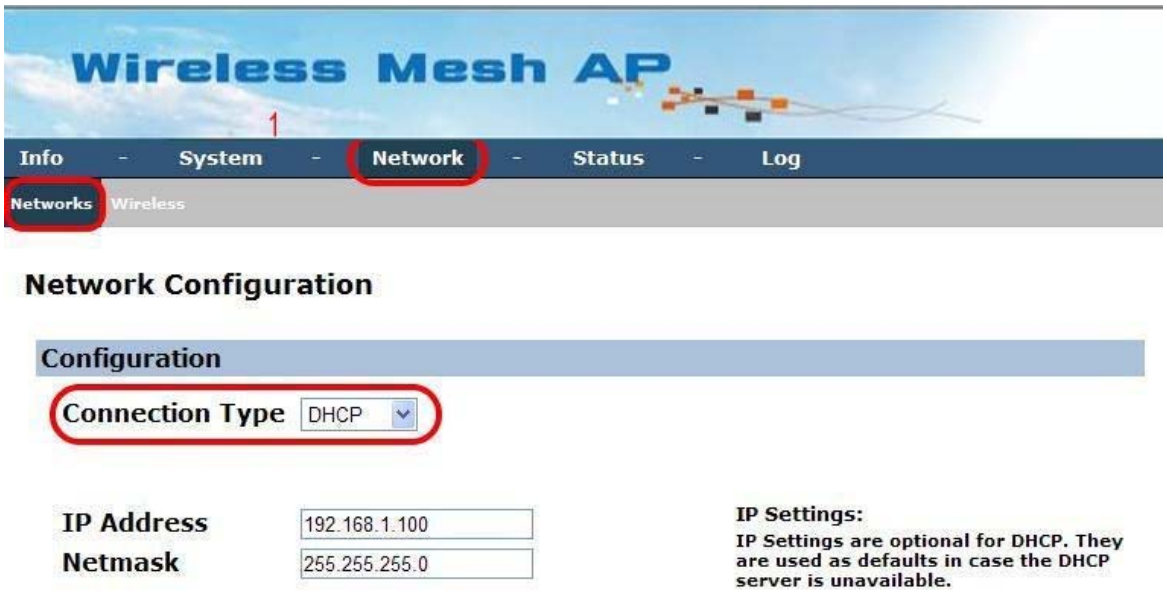
2-7. Select [Disabled] or [AES] in **Encryption Type**.

■**AES Passphrase**: Create a encryption between Mesh AP.

2-8. Select [Static IP] in **Connection Type**. You can also change the settings of [IP Address], [Netmask] and [Default Gateway].



2-9. Select [DHCP] in **Connection Type**.



2-10. Click [Save Changes].

2-11. Changes are saved in temporary memory.

2-12. Click [Save Flash] to save permanently.

Note 1: [Save Changes], [Save Flash] and reboot are required for all changes.

Note 2: It takes about 2 minutes to complete reboot.

2-13. Click [System] \ [Reboot] \ [Yes, really reboot now].

Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
1
Info - System - Network - Status - Log
Settings Password Backup & Restore Upgrade Reboot
Yes, reboot now

3. Configure AP+STA (Repeater) Mode

■ rrSupport **Open** / **WEP** Key

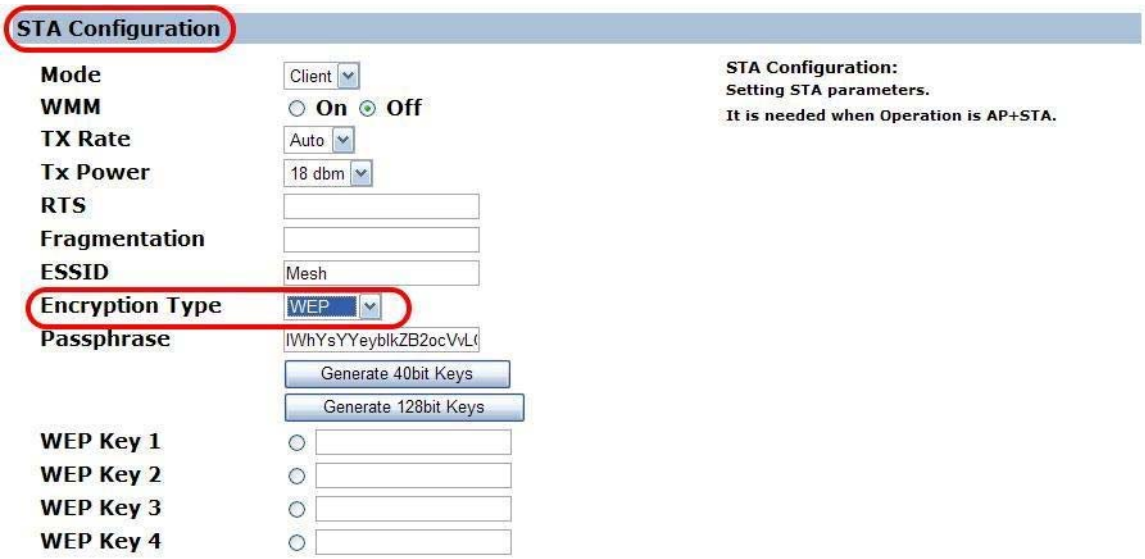
■ rrSupport ***WDS-Capable*** AP

■ rrBlock Diagram :

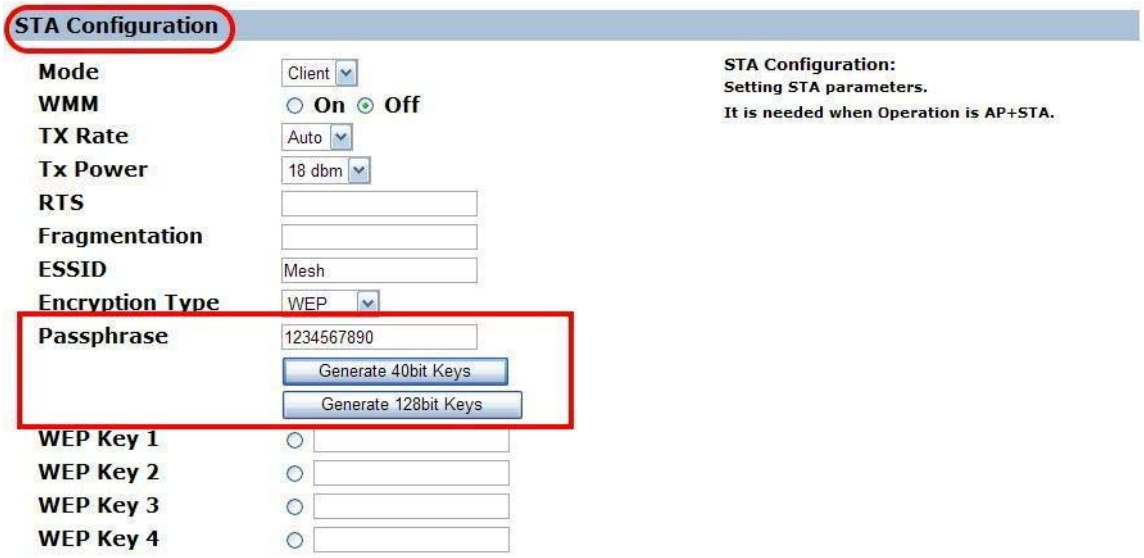
3-1. You can set Mesh AP to work as [AP+STA] mode. [Network] \ [Wireless] \ [AP+STA]

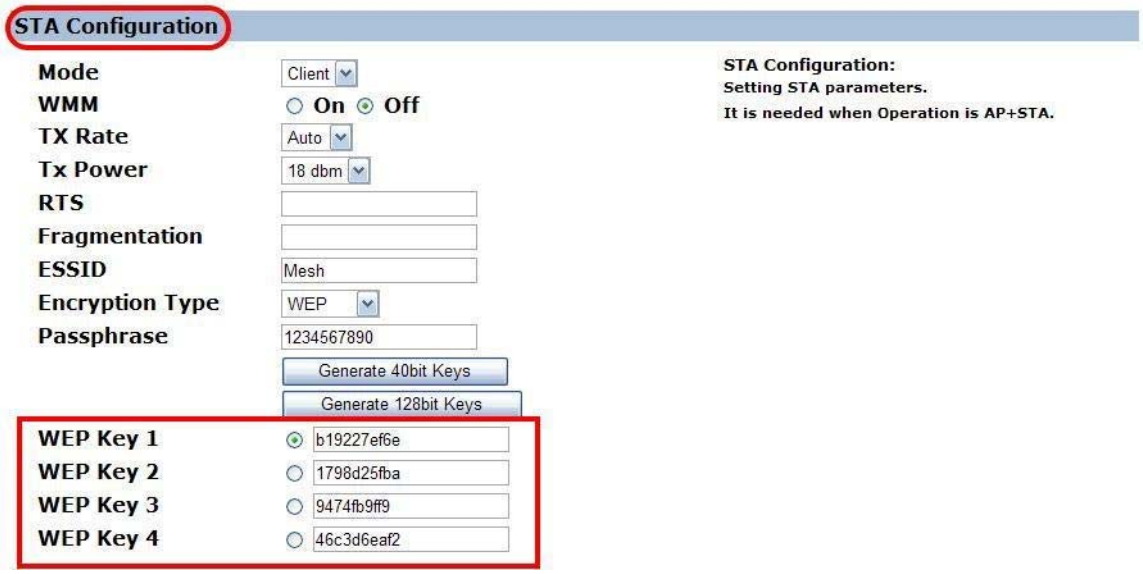
3-2. The Default **ESSID** is [any]

3-3. Select [Disabled] or [WEP] in **Encryption Type**.

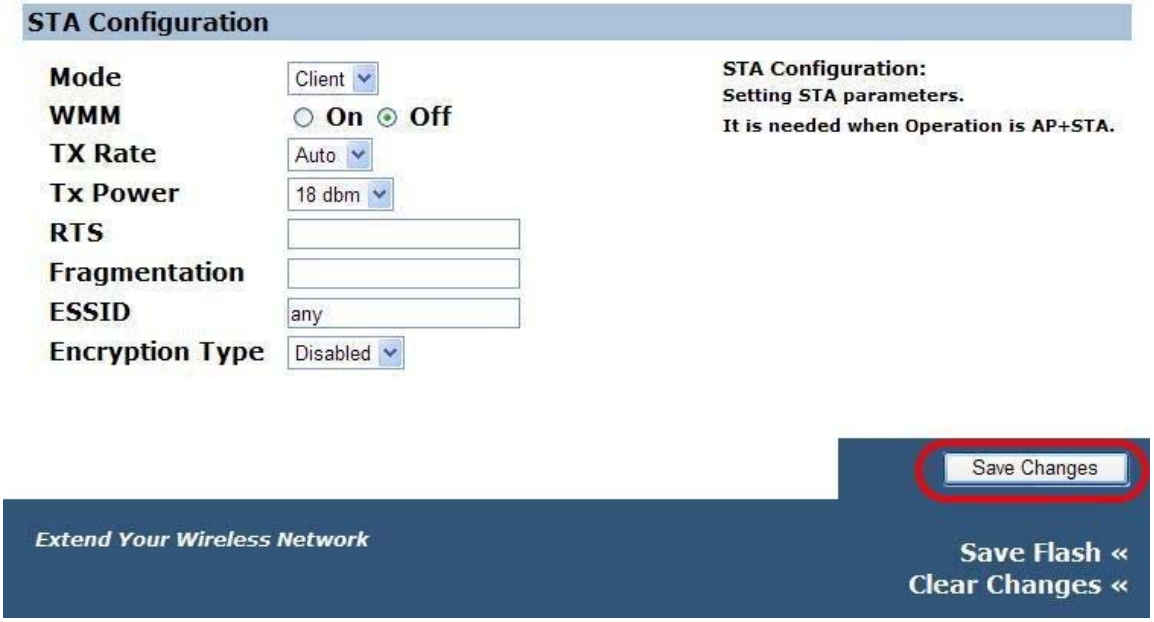


3-4. Enter numbers and/or letters in **Passphrase**, and click [Generate 40bit Keys] or [Generate 128bit Keys].



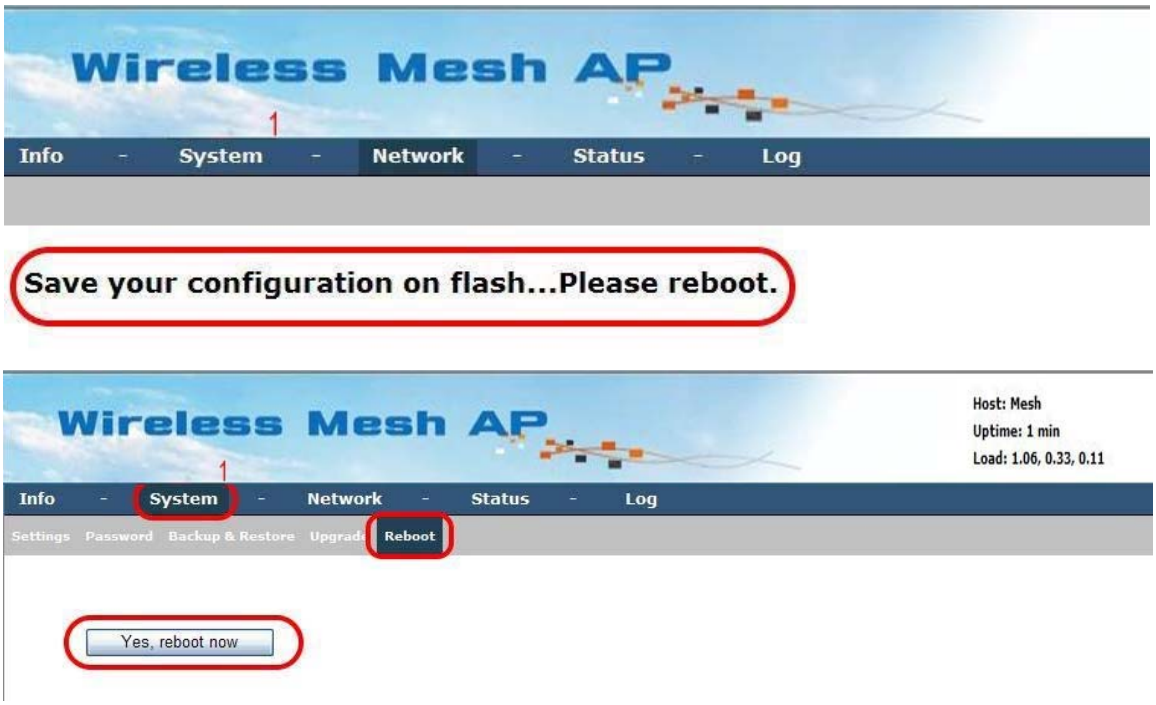


3-5. Click [Save Changes].



3-6. Click [Save Flash].

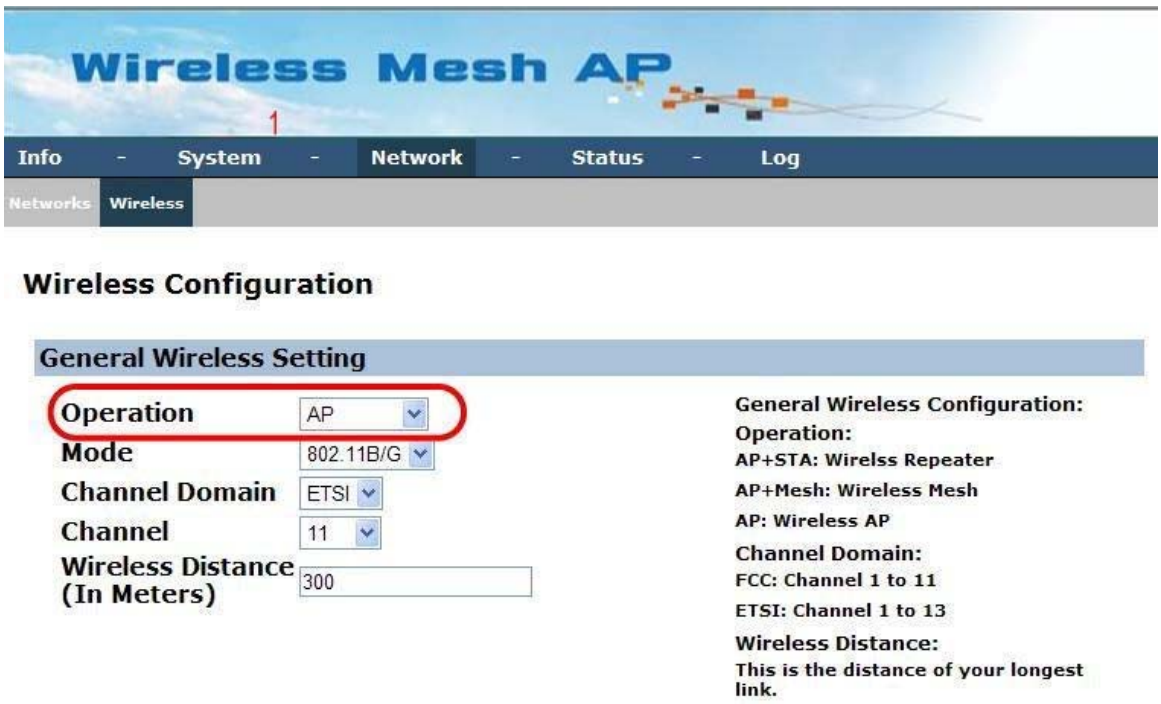
3-7. Reboot Mesh AP. Click [System] \ [Reboot] \ [Yes, really reboot now].


Wireless Mesh AP
1
Info - System - Network - Status - Log
Save your configuration on flash...Please reboot.
Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
1
Info - System - Network - Status - Log
Settings Password Backup & Restore Upgrade Reboot
Yes, reboot now

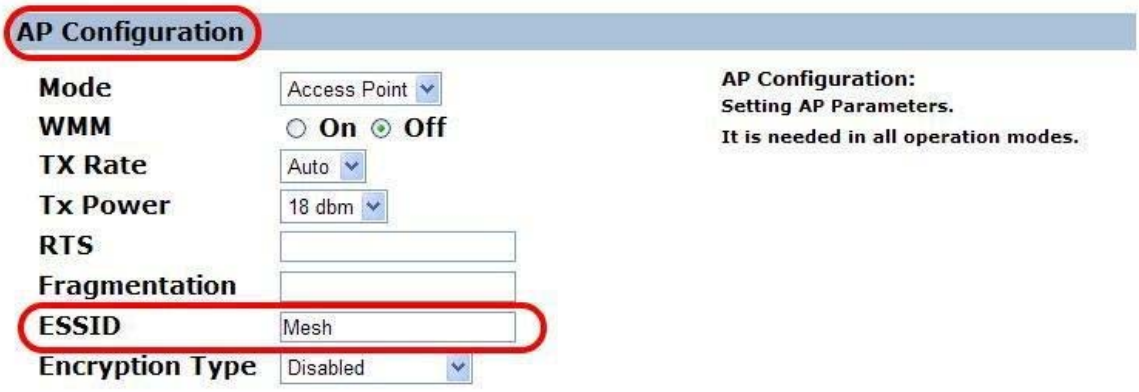
4. Configure AP Mode

- ■rrSupport **Open** / **WEP 64/128 Bit Key**
- ■rrSupport **WPA-PSK**, **WPA2-PSK**
- ■rrCipher Type: **TKIP**, **AES**
- ■rrSupport **WPA-EAP**, **WPA2-EAP**
- ■rrSupport **TLS/TTLS/PEAP**
- ■rrSupport QoS: **WMM**
- ■rrBlock Diagram :

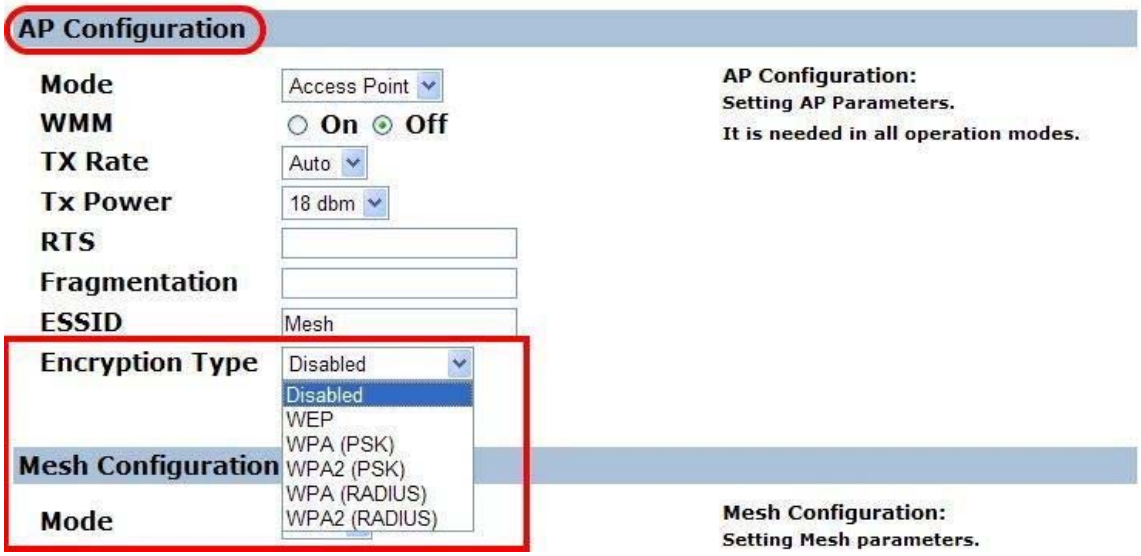
4-1. Mesh AP can work as [AP] mode. [Network] \ [Wireless] \ [Operation]



4-2. The default **ESSID** is [Mesh]



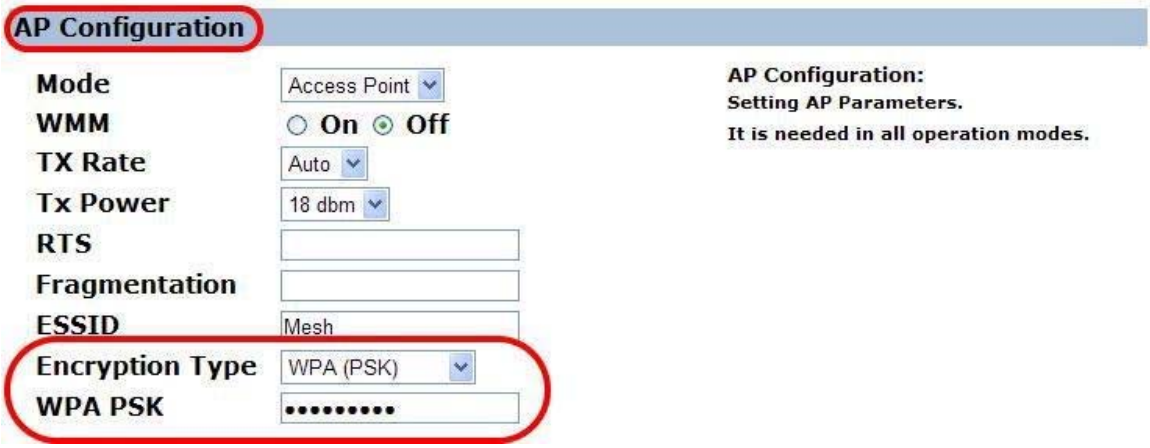
4-3. There are different selections in **Encryption Type**. Click **WEP** in **Encryption Type**.

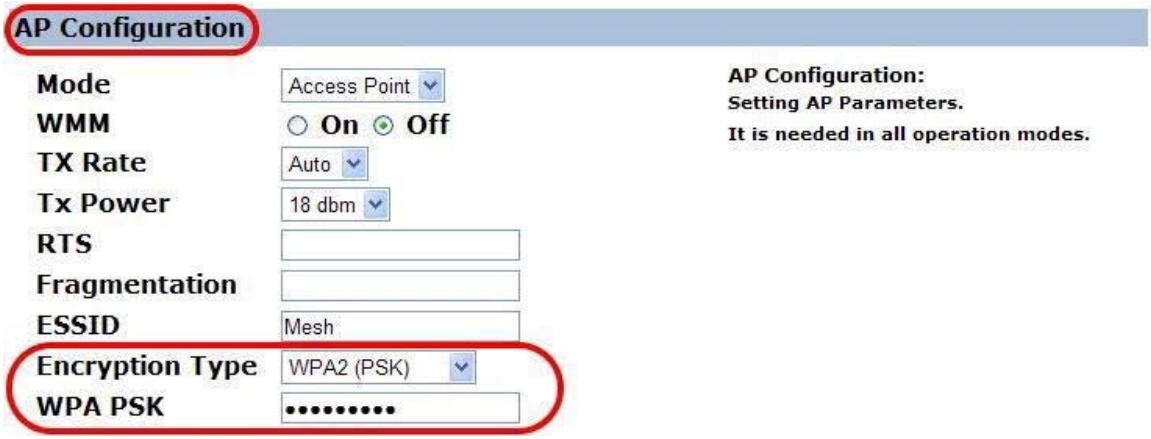


4-3-1. Encryption Type: ***WEP***

4-3-2. Encryption Type: ***WPA (PSK)*** *or* ***WPA2 (PSK)***

WPA PSK: 8-63 characters



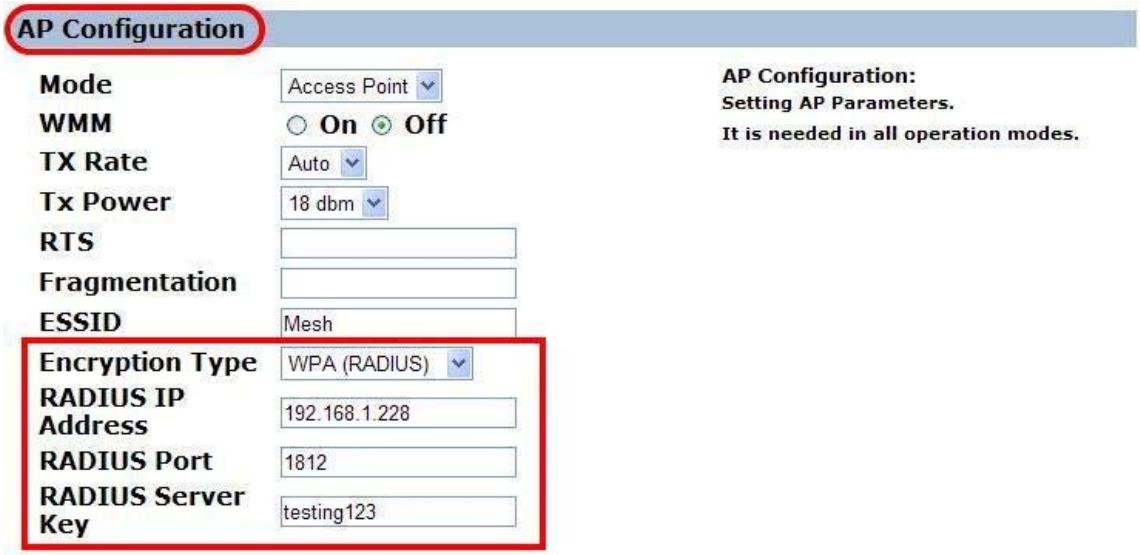


4-3-3. Encryption Type: ***WPA (RADIUS)*** *or* ***WPA2 (RADIUS)***

RADIUS IP Address: RADIUS Server IP

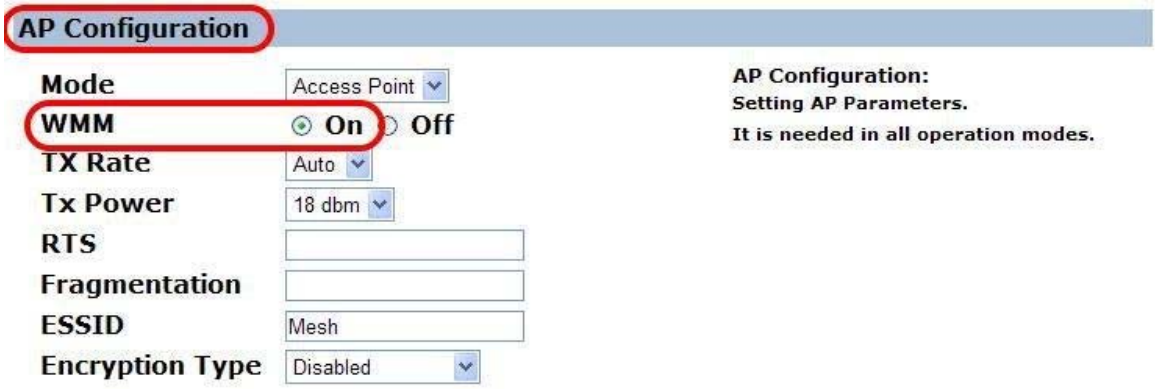
RADIUS Port: 1812

RADIUS Server key: 1-32 characters

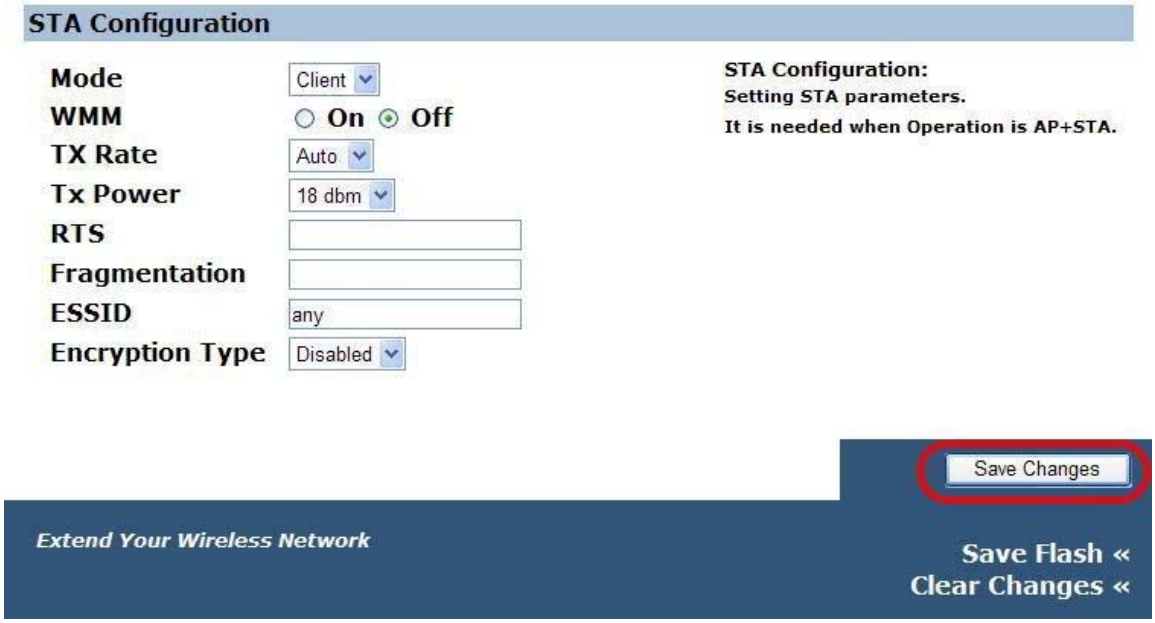


4-3-4. QoS: Select [On] or [Off].

The WMM (Wi-Fi Multimedia) for Quality of Service and configurable dedicated SSID for Voice/Video enables you to take advantage of low cost call via Voice-over-IP. Flexibility Setting.

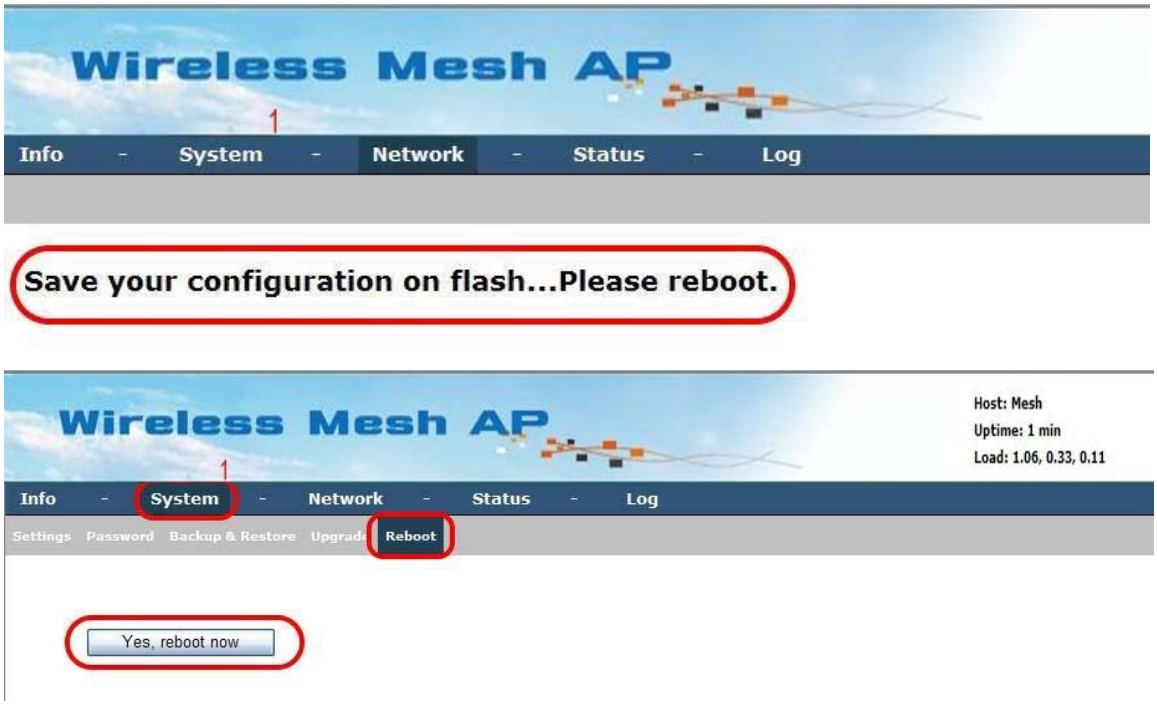


4-4. Click [Save Changes].



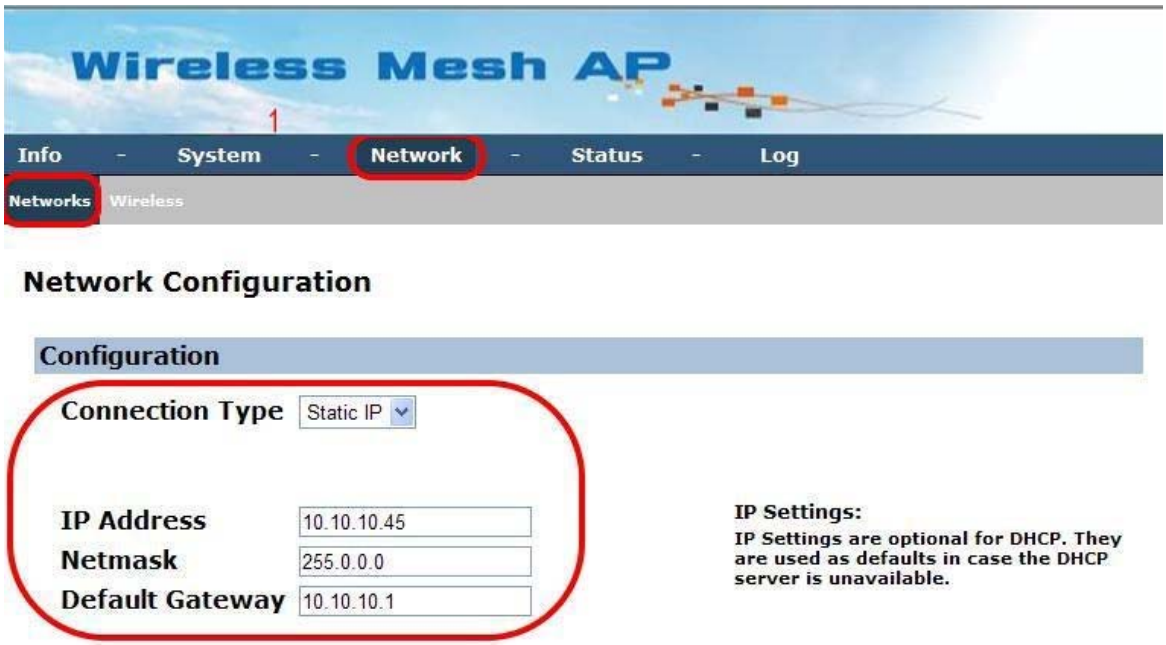
4-5. Click [Save Flash].

4-6. Reboot Mesh AP. Click [System] \ [Reboot] \ [Yes, really reboot now].

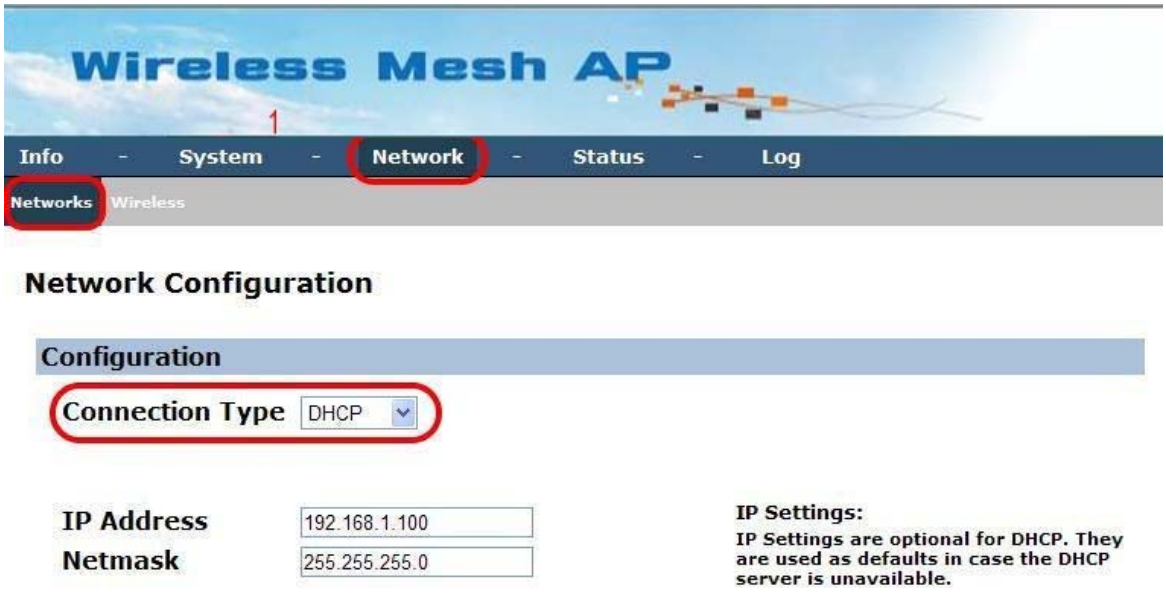


Set Mesh AP IP

1. Static IP Mode: Change AP IP Address


Wireless Mesh AP
1
Info - System - Network - Status - Log
Networks Wireless
Network Configuration
Configuration
Connection Type Static IP
IP Address 10.10.10.45
Netmask 255.0.0.0
Default Gateway 10.10.10.1
IP Settings:
IP Settings are optional for DHCP. They are used as defaults in case the DHCP server is unavailable.

2. DHCP Mode

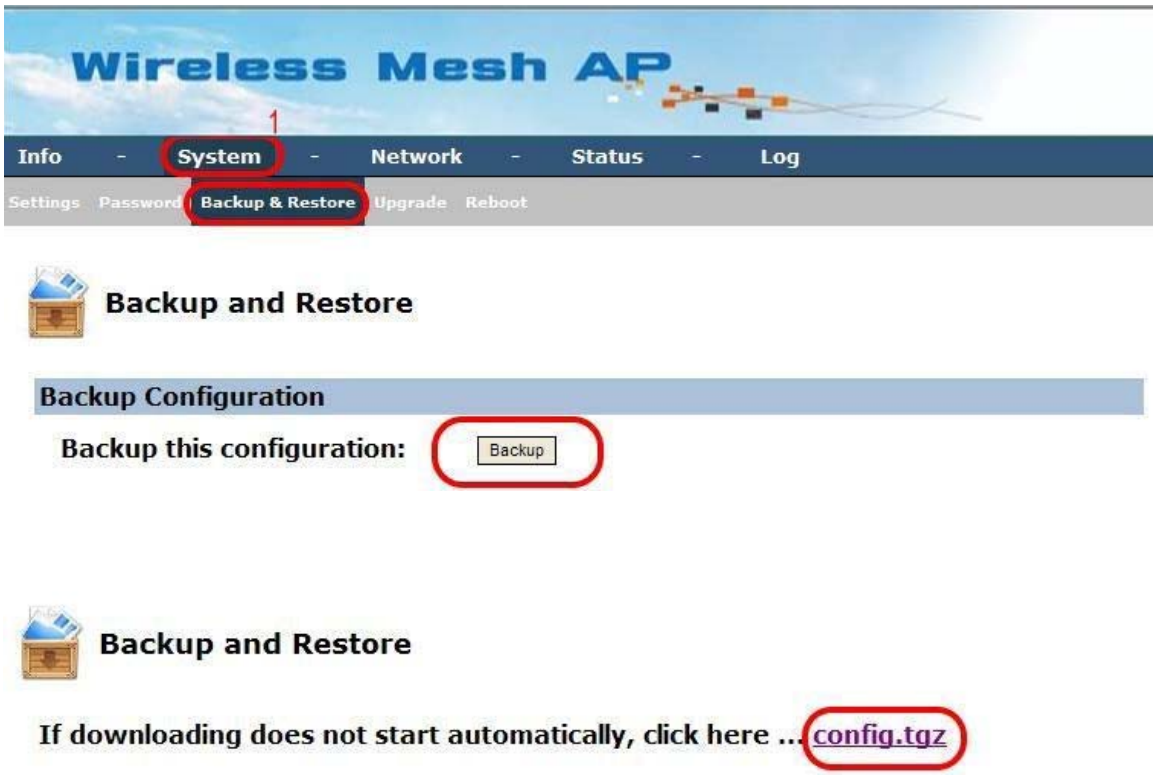

Wireless Mesh AP
1
Info - System - Network - Status - Log
Networks Wireless
Network Configuration
Configuration
Connection Type DHCP
IP Address 192.168.1.100
Netmask 255.255.255.0
IP Settings:
IP Settings are optional for DHCP. They are used as defaults in case the DHCP server is unavailable.

Set Login Password

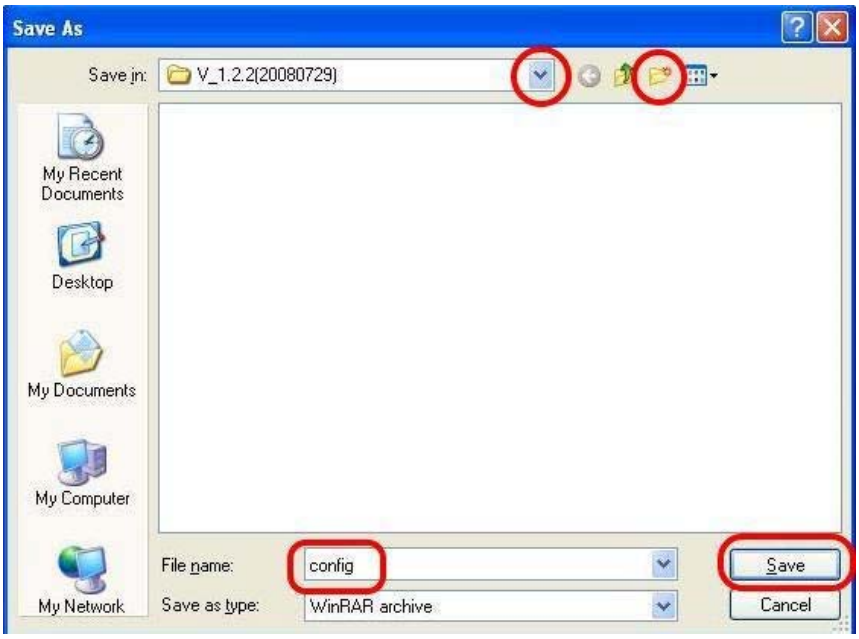
1. Change login password: [System] \ [Password]

Backup & Restore

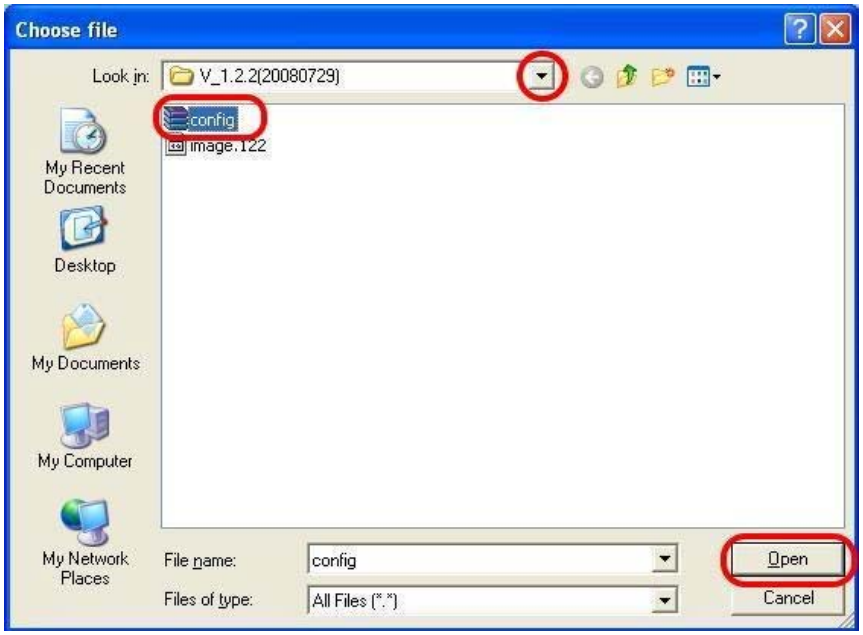
1. Backup: [System] \ [Backup & Restore] \ [Backup]



File Download
Do you want to open or save this file?
Name: config.tgz
Type: WinRAR archive, 1.85KB
From: 192.168.1.100
Open
Save
Cancel
Always ask before opening this type of file
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?


Save As
Save in:
V_1.2.2(20080729)
My Recent Documents
Desktop
My Documents
My Computer
My Network
File name:
config
Save as type:
WinRAR archive
Save
Cancel

2. Restore**:** [System] \ [Backup & Restore] \ [Restore]



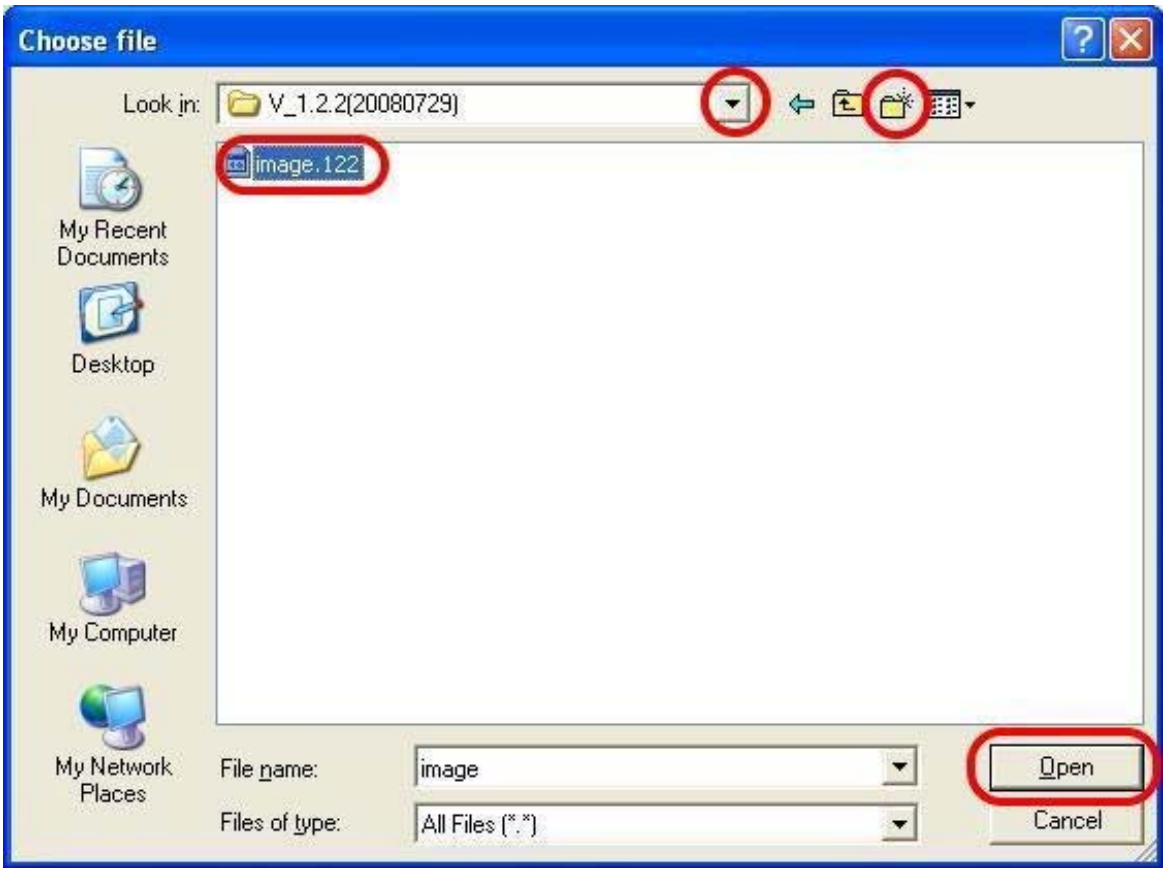
Back to Factory Default

- Step 1: Power up Mesh AP and wait for 2 minutes.
- Step 2: Click [System] \ [Backup & Restore] \ [Default].
- Step 3: Click [Save Flash] and reboot.
- Step 4: Wait for Mesh AP to reboot.

Firmware Upgrade

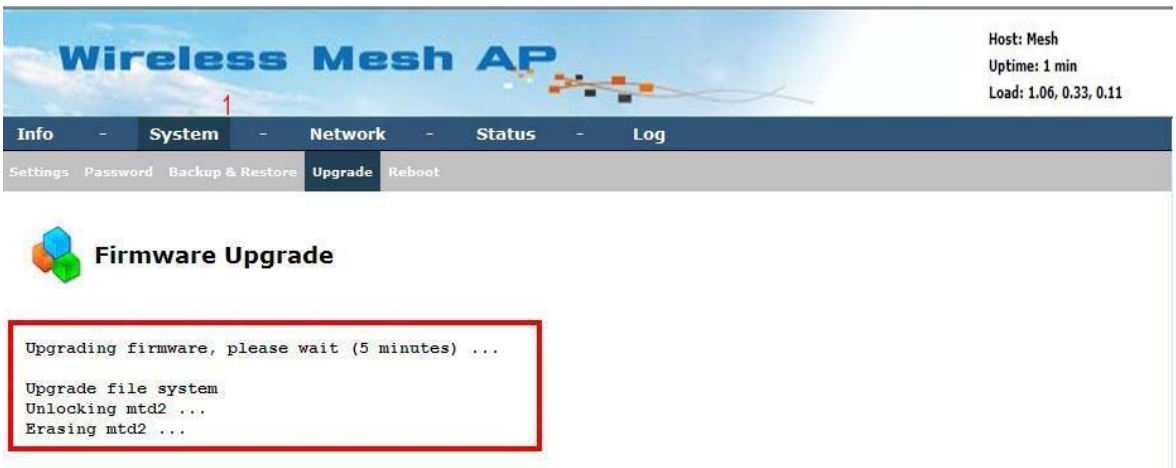
1. Click [System] \ [Upgrade] \ [Browse…]

2. Select firmware and click [Open].



3. Click [Upgrade].

4. Firmware Upgrading…



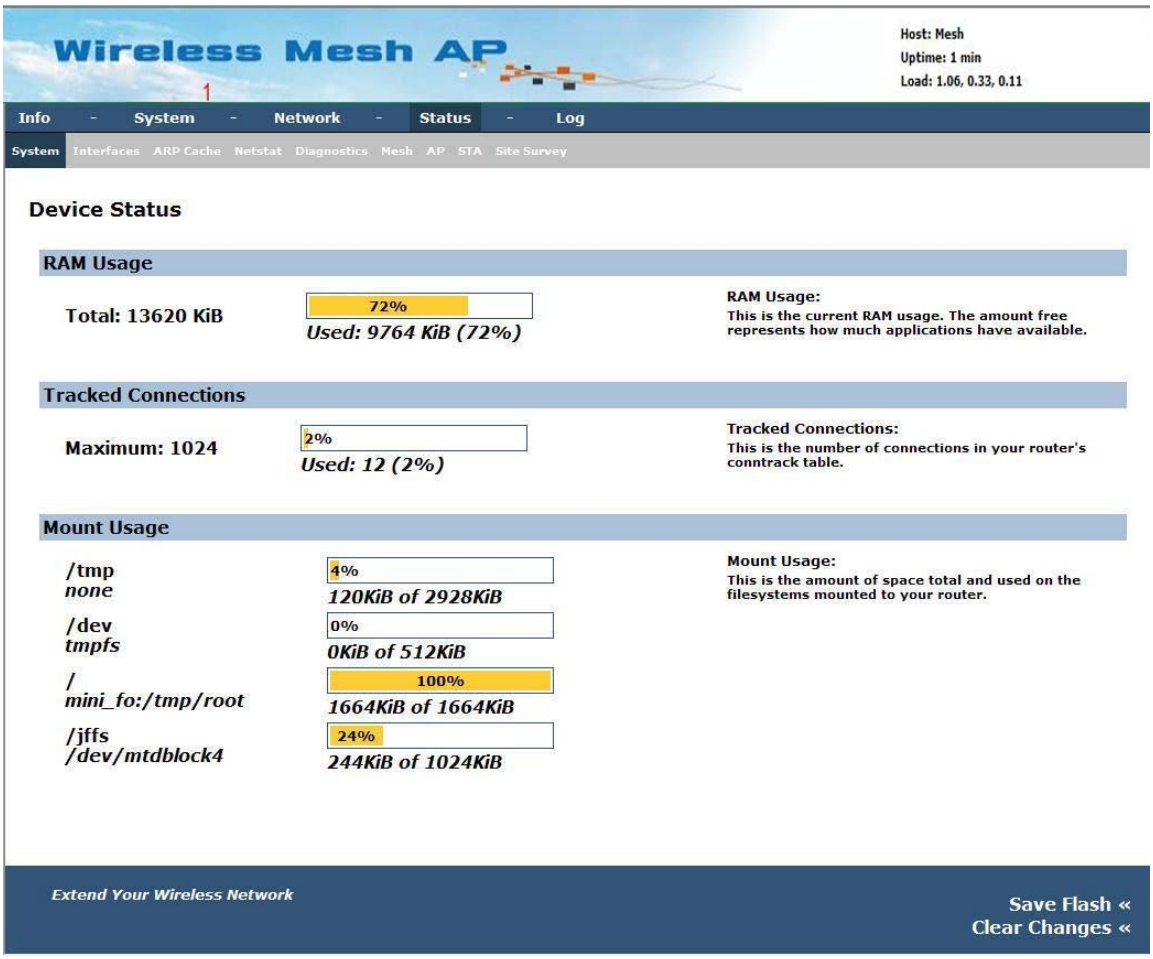
5. Firmware Upgrading Completed, Rebooting…

Change Mesh AP Name

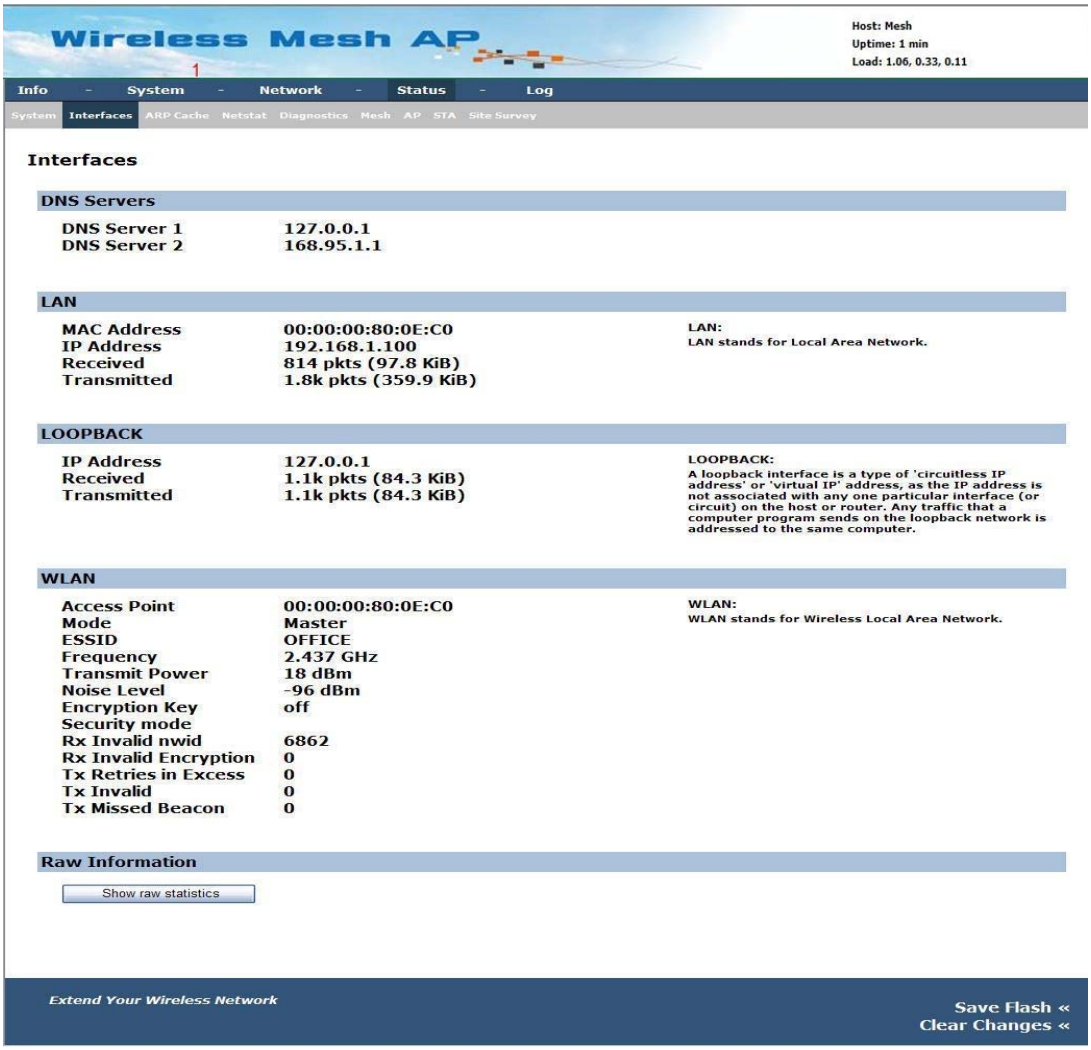
1. Change Mesh AP name: [System] \ [Setting], enter a desired **Host Name**.

Mesh AP Status

1. Click [Status] \ [System].



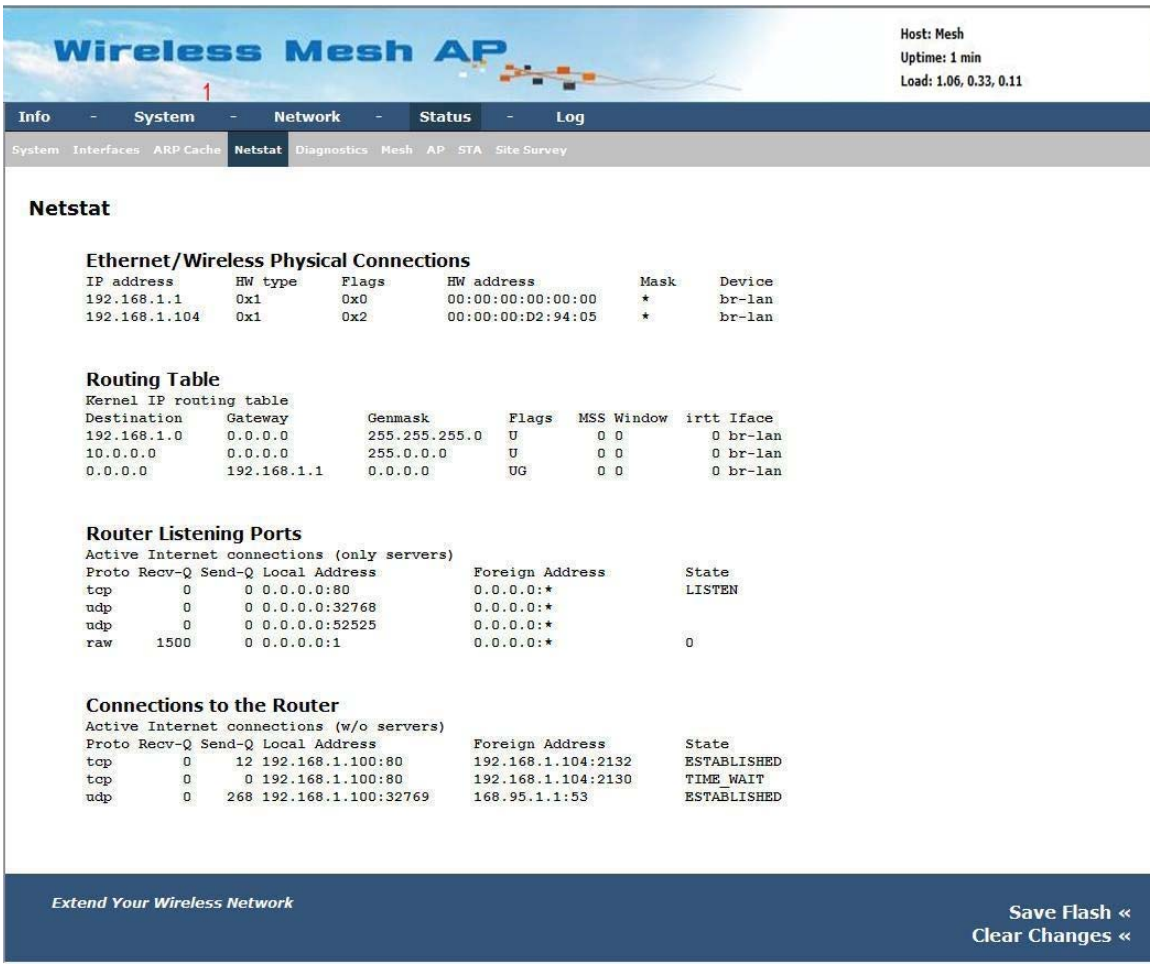
2. Click [Status] \ [Interfaces].


Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
1
Info - System - Network - Status - Log
System Interfaces ARP Cache Netstat Diagnostics Mesh AP STA Site Survey
Interfaces
DNS Servers
DNS Server 1 127.0.0.1
DNS Server 2 168.95.1.1
LAN
MAC Address 00:00:00:80:0E:C0
IP Address 192.168.1.100
Received 814 pkts (97.8 KiB)
Transmitted 1.8k pkts (359.9 KiB)
LAN:
LAN stands for Local Area Network.
LOOPBACK
IP Address 127.0.0.1
Received 1.1k pkts (84.3 KiB)
Transmitted 1.1k pkts (84.3 KiB)
LOOPBACK:
A loopback interface is a type of 'circuitless IP address' or 'virtual IP' address, as the IP address is not associated with any one particular interface (or circuit) on the host or router. Any traffic that a computer program sends on the loopback network is addressed to the same computer.
WLAN
Access Point 00:00:00:80:0E:C0
Mode Master
ESSID OFFICE
Frequency 2.437 GHz
Transmit Power 18 dBm
Noise Level -96 dBm
Encryption Key off
Security mode
Rx Invalid nwid 6862
Rx Invalid Encryption 0
Tx Retries in Excess 0
Tx Invalid 0
Tx Missed Beacon 0
WLAN:
WLAN stands for Wireless Local Area Network.
Raw Information
Show raw statistics
Extend Your Wireless Network
Save Flash «
Clear Changes «

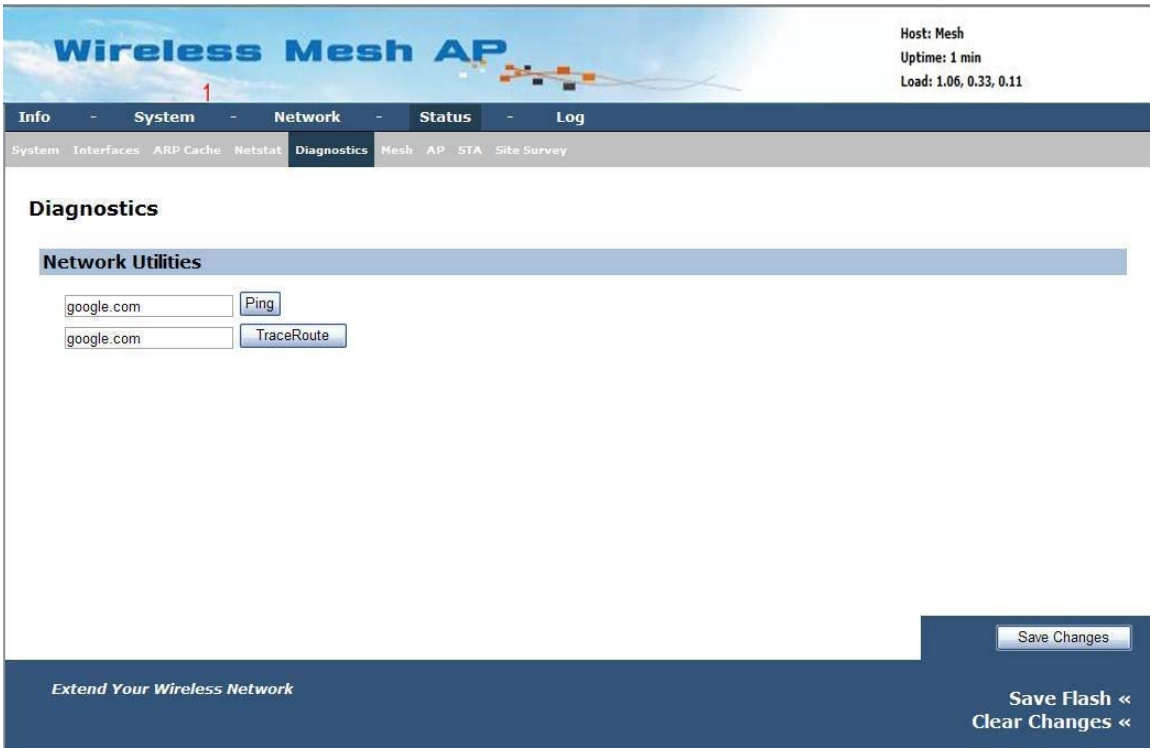
3. Click [Status] \ [ARP Cache].

Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
Info - System - Network - Status - Log
System Interfaces ARP Cache Netstat Diagnostics Mesh AP STA Site Survey
ARP Cache
Address Resolution Protocol Cache (ARP)
MAC Address IP Address HW Type Flags Mask
00:00:00:00:00:00 192.168.1.1 ETHER 0x0 *
00:1D:7D:D2:94:05 192.168.1.104 ETHER C (completed) *
Extend Your Wireless Network
Save Flash «
Clear Changes «

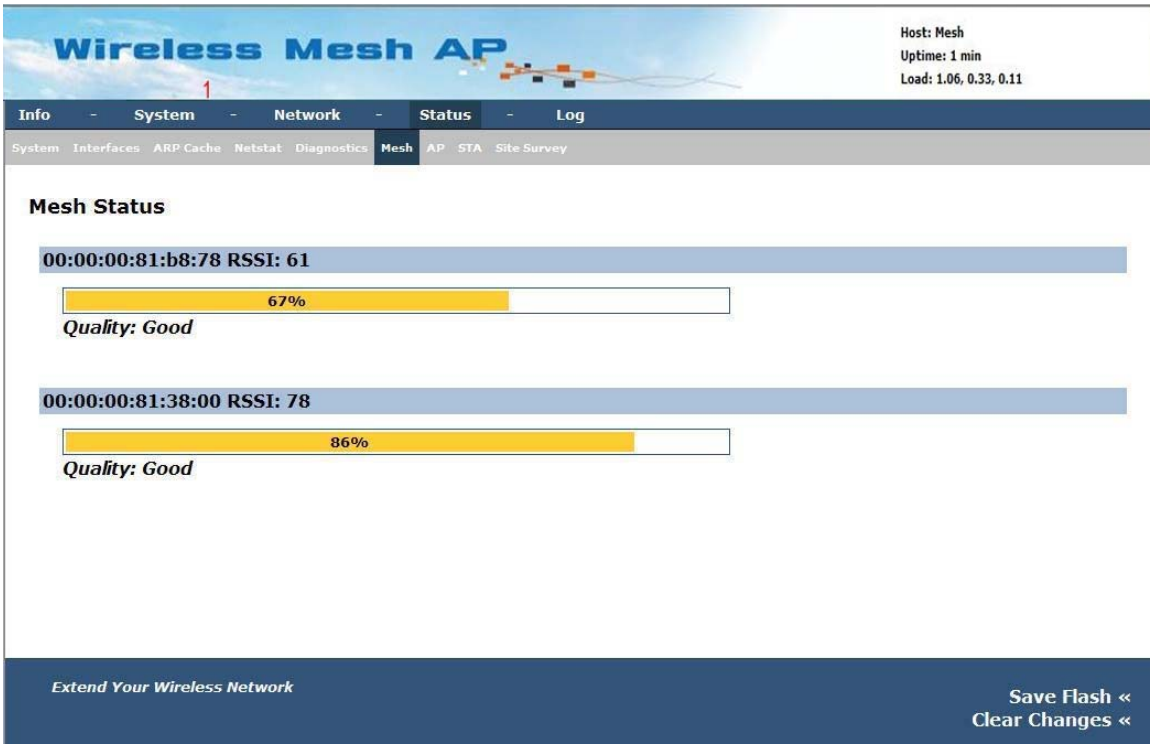
4. Click [Status] \ [Netstat].


Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
Info - System - Network - Status - Log
System Interfaces ARP Cache Netstat Diagnostics Mesh AP STA Site Survey
Netstat
Ethernet/Wireless Physical Connections
IP address HW type Flags HW address Mask Device
192.168.1.1 0x1 0x0 00:00:00:00:00:00 * br-lan
192.168.1.104 0x1 0x2 00:00:00:D2:94:05 * br-lan
Routing Table
Kernel IP routing table
Destination Gateway Genmask Flags MSS Window irtt Iface
192.168.1.0 0.0.0.0 255.255.255.0 U 0 0 0 br-lan
10.0.0.0 0.0.0.0 255.0.0.0 U 0 0 0 br-lan
0.0.0.0 192.168.1.1 0.0.0.0 UG 0 0 0 br-lan
Router Listening Ports
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 0 0.0.0.0:80 0.0.0.0:* LISTEN
udp 0 0 0.0.0.0:32768 0.0.0.0:*
udp 0 0 0.0.0.0:52525 0.0.0.0:*
raw 1500 0 0.0.0.0:1 0.0.0.0:* 0
Connections to the Router
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 12 192.168.1.100:80 192.168.1.104:2132 ESTABLISHED
tcp 0 0 192.168.1.100:80 192.168.1.104:2130 TIME_WAIT
udp 0 268 192.168.1.100:32769 168.95.1.1:53 ESTABLISHED
Extend Your Wireless Network
Save Flash «
Clear Changes «

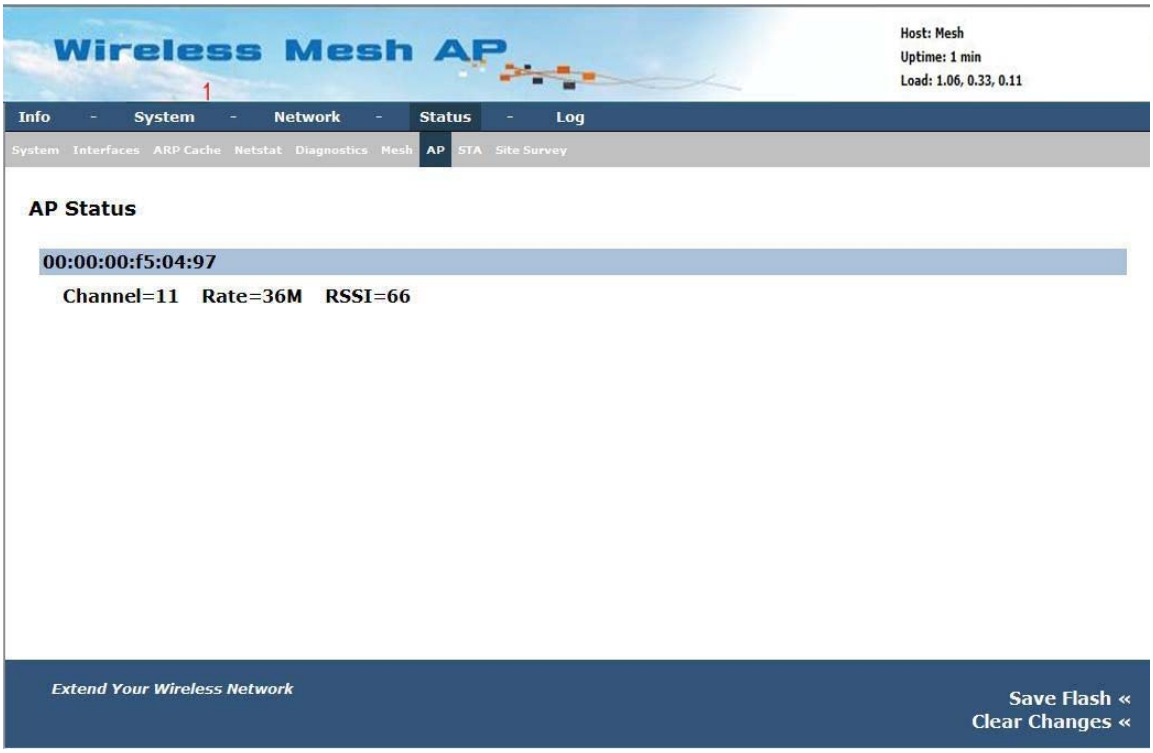
5. Click [Status] \ [Diagnostics].



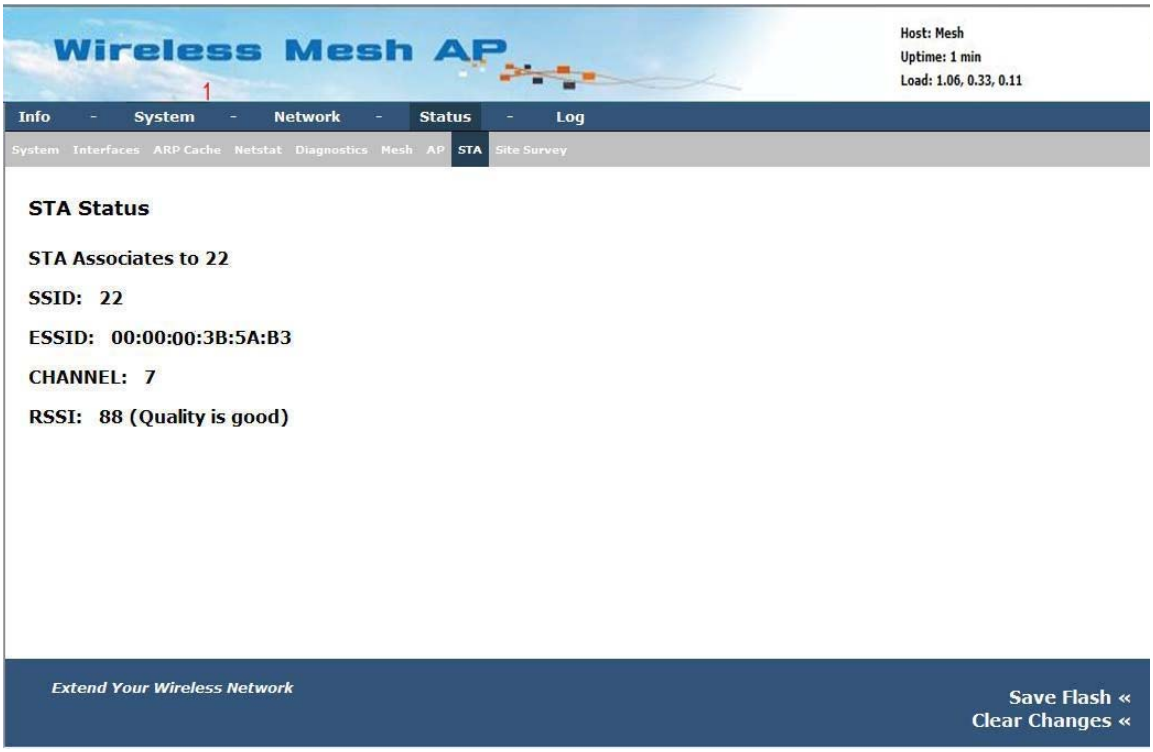
6. Click [Status] \ [Mesh].



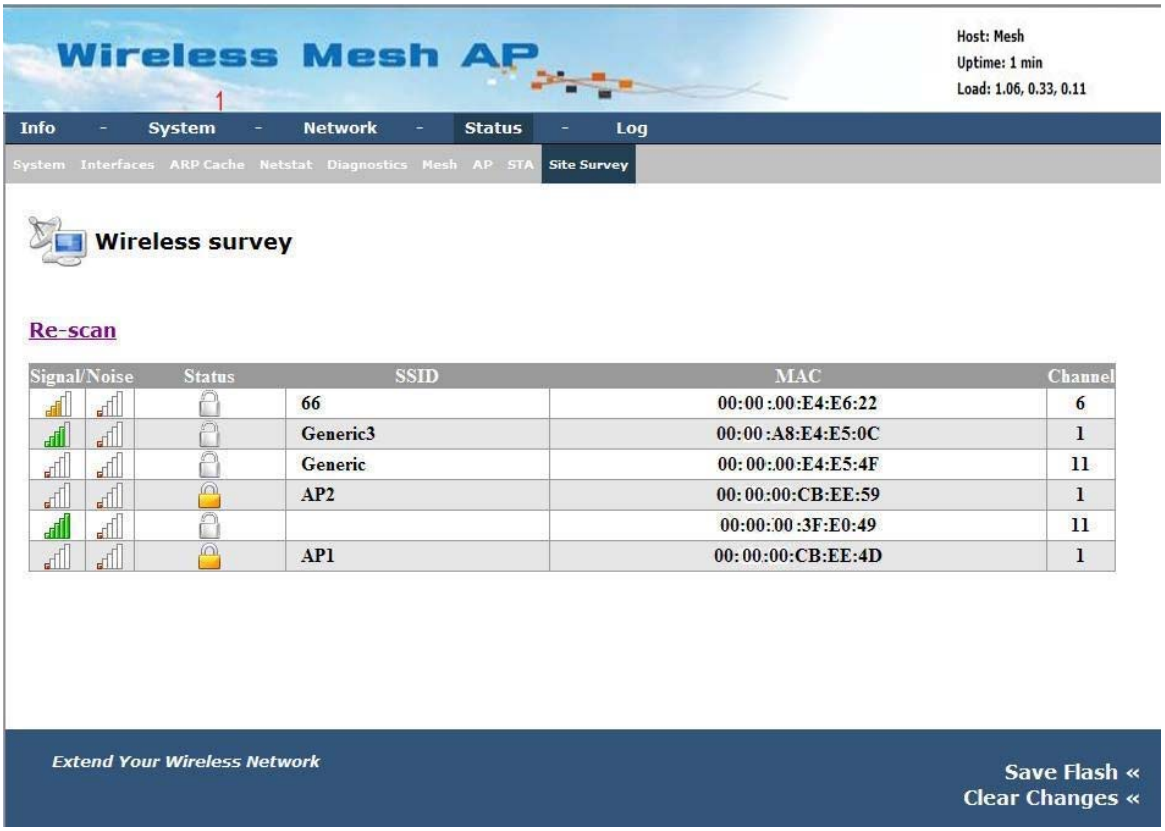
7. Click [Status] \ [AP].


Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
Info - System - Network - Status - Log
System Interfaces ARP Cache Netstat Diagnostics Mesh AP STA Site Survey
AP Status
00:00:00:f5:04:97
Channel=11 Rate=36M RSSI=66
Extend Your Wireless Network
Save Flash «
Clear Changes «

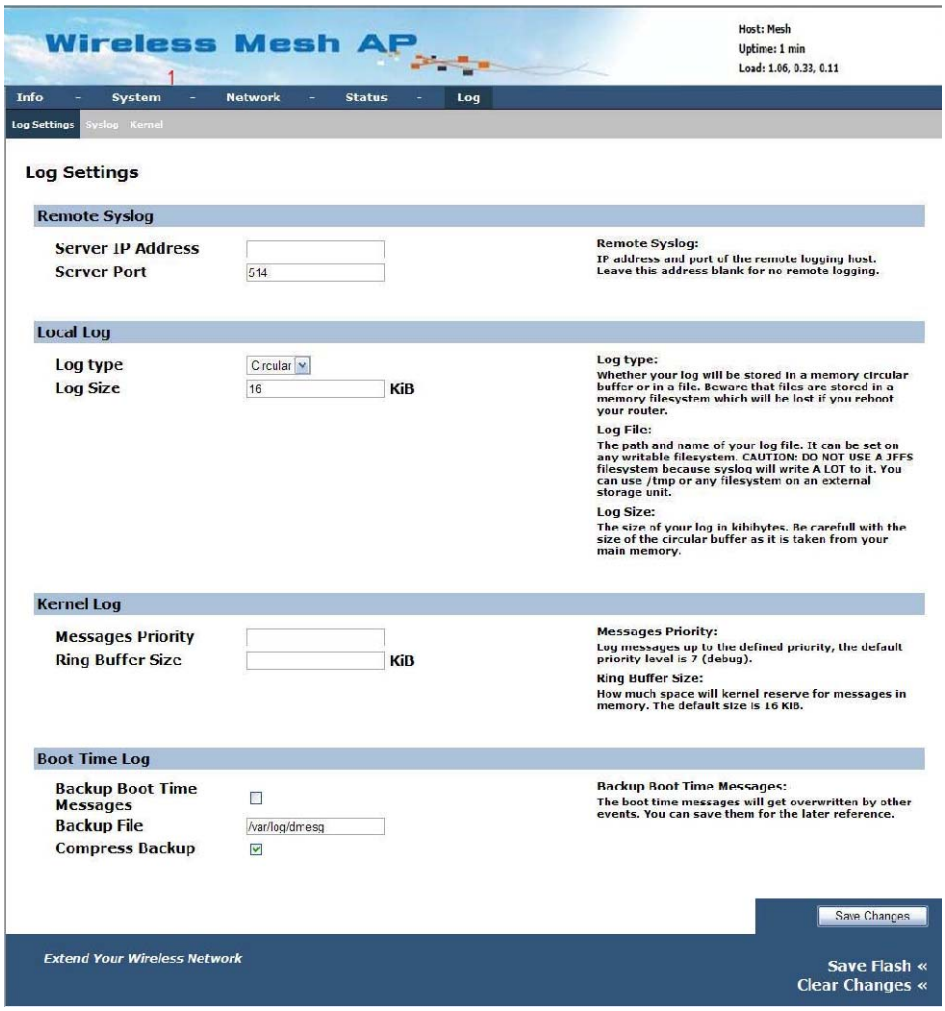
8. Click [Status] \ [STA].



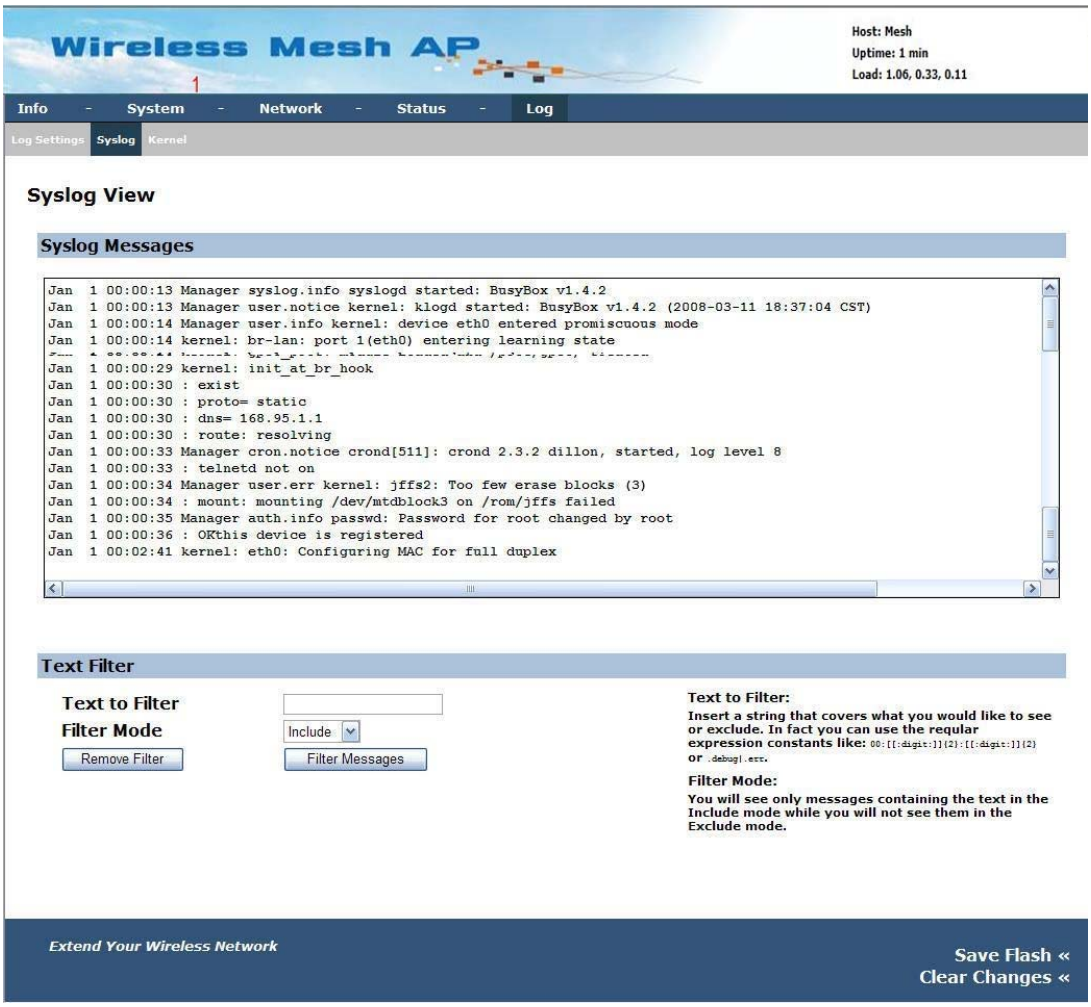
9. Click [Status] \ [Site Survey].
   Only available under [AP+STA] mode.



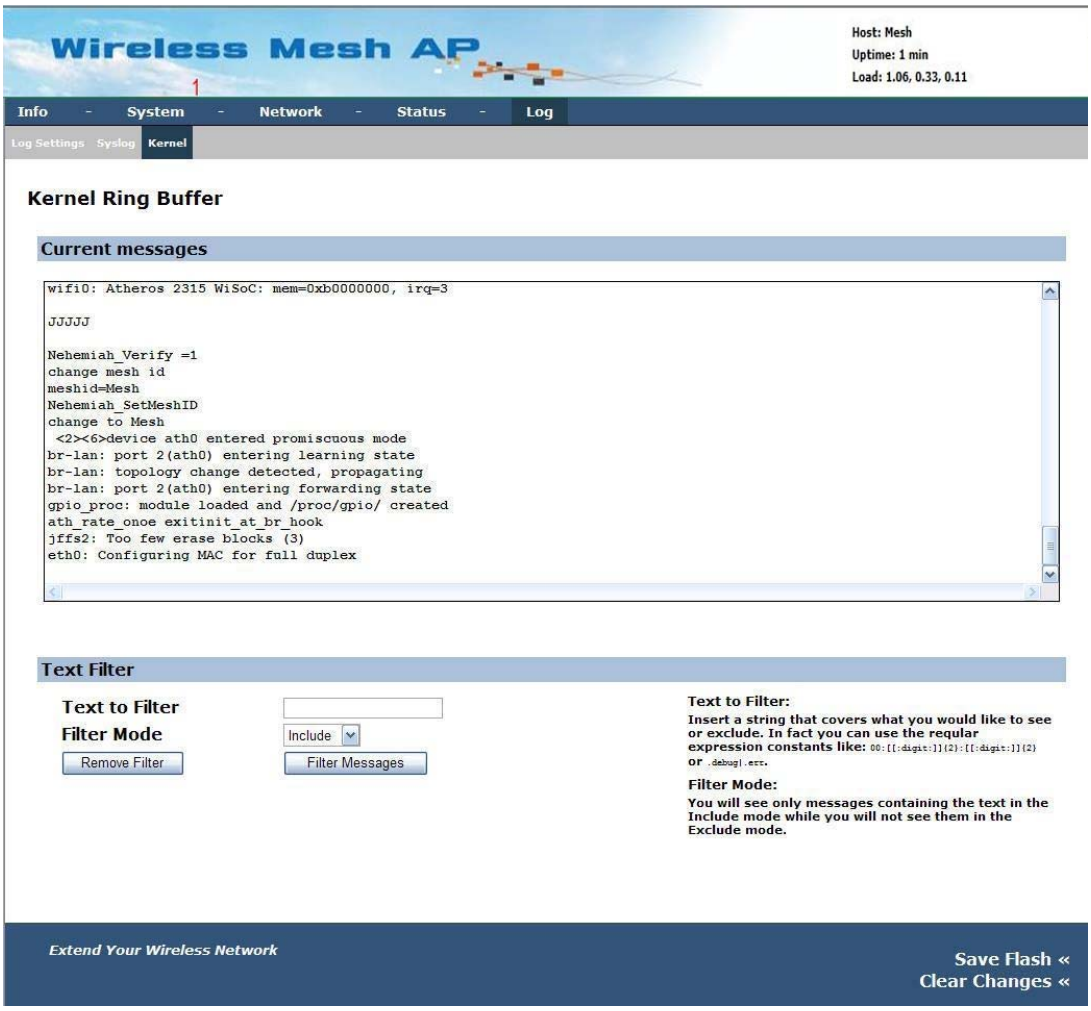
10. Click [Log] \ [Log Settings].


Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
Info - System - Network - Status - Log
Log Settings Syslog Kernel
Log Settings
Remote Syslog
Server IP Address
Server Port
514
Remote Syslog:
IP address and port of the remote logging host. Leave this address blank for no remote logging.
Local Log
Log type
Circular
Log Size
16
KiB
Log type:
Whether your log will be stored in a memory circular buffer or in a file. Beware that files are stored in a memory filesystem which will be lost if you reboot your router.
Log File:
The path and name of your log file. It can be set on any writable filesystem. CAUTION: DO NOT USE A JFFS filesystem because syslog will write A LOT to it. You can use /tmp or any filesystem on an external storage unit.
Log Size:
The size of your log in kibibytes. Be carefull with the size of the circular buffer as it is taken from your main memory.
Kernel Log
Messages Priority
Ring Buffer Size
KiB
Messages Priority:
Log messages up to the defined priority, the default priority level is 7 (debug).
Ring Buffer Size:
How much space will kernel reserve for messages in memory. The default size is 16 KiB.
Boot Time Log
Backup Boot Time Messages
Backup File
/var/log/dmesg
Compress Backup
Backup Boot Time Messages:
The boot time messages will get overwritten by other events. You can save them for the later reference.
Save Changes
Extend Your Wireless Network
Save Flash «
Clear Changes «

11. Click [Log] \ [Syslog].


Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
Info - System - Network - Status - Log
Log Settings Syslog Kernel
Syslog View
Syslog Messages
Jan 1 00:00:13 Manager syslog.info syslogd started: BusyBox v1.4.2
Jan 1 00:00:13 Manager user.notice kernel: klogd started: BusyBox v1.4.2 (2008-03-11 18:37:04 CST)
Jan 1 00:00:14 Manager user.info kernel: device eth0 entered promiscuous mode
Jan 1 00:00:14 kernel: br-lan: port 1(eth0) entering learning state
Jan 1 00:00:29 kernel: init_at_br_hook
Jan 1 00:00:30 : exist
Jan 1 00:00:30 : proto= static
Jan 1 00:00:30 : dns= 168.95.1.1
Jan 1 00:00:30 : route: resolving
Jan 1 00:00:33 Manager cron.notice crond[511]: crond 2.3.2 dillon, started, log level 8
Jan 1 00:00:33 : telnetd not on
Jan 1 00:00:34 Manager user.err kernel: jffs2: Too few erase blocks (3)
Jan 1 00:00:34 : mount: mounting /dev/mtdblock3 on /rom/jffs failed
Jan 1 00:00:35 Manager auth.info passwd: Password for root changed by root
Jan 1 00:00:36 : OKthis device is registered
Jan 1 00:02:41 kernel: eth0: Configuring MAC for full duplex
Text Filter
Text to Filter
Filter Mode
Include
Remove Filter
Filter Messages
Text to Filter:
Insert a string that covers what you would like to see or exclude. In fact you can use the regular expression constants like: 00:[[:digit:]]{2}:[[:digit:]]{2} or .debug|.err.
Filter Mode:
You will see only messages containing the text in the Include mode while you will not see them in the Exclude mode.
Extend Your Wireless Network
Save Flash «
Clear Changes «

12. Click [Log] \ [Kernel].


Wireless Mesh AP
Host: Mesh
Uptime: 1 min
Load: 1.06, 0.33, 0.11
1
Info - System - Network - Status - Log
Log Settings Syslog Kernel
Kernel Ring Buffer
Current messages
wifi0: Atheros 2315 WiSoC: mem=0xb0000000, irq=3
JJJJJ
Nehemiah_Verify =1
change mesh id
meshid=Mesh
Nehemiah_SetMeshID
change to Mesh
<2><6>device ath0 entered promiscuous mode
br-lan: port 2(ath0) entering learning state
br-lan: topology change detected, propagating
br-lan: port 2(ath0) entering forwarding state
gpio_proc: module loaded and /proc/gpio/ created
ath_rate_onoe exitinit_at_br_hook
jffs2: Too few erase blocks (3)
eth0: Configuring MAC for full duplex
Text Filter
Text to Filter
Filter Mode
Include
Remove Filter
Filter Messages
Text to Filter:
Insert a string that covers what you would like to see or exclude. In fact you can use the regular expression constants like: 00:[[:digit:]]{2}:[[:digit:]]{2} or .debug|.err.
Filter Mode:
You will see only messages containing the text in the Include mode while you will not see them in the Exclude mode.
Extend Your Wireless Network
Save Flash «
Clear Changes «

Troubleshooting

- Q : Why can’t I connect Mesh AP under [AP+STA] mode?
- A : Add a WDS setting in remote AP.

- Q : Configuration is not effective?
- A : Please reboot Mesh AP.

- Q : Configuration is not saved after reboot?
- A : Click [Save Flash] before reboot. Please refer to page 42.

Technical Specifications

Interface • 1 x RJ-45 10/100Mbps port • 1 x 802.11b/g wireless interface **QoS** Wireless Multimedia Extensions ; WMM (802.11e)	**Security Features** • WEP 64/128-bit • WPA-PSK (TKIP/AES), WPA-EAP • WPA2- PSK (TKIP/AES), WPA2-EAP
Wireless Features • Interoperable with 802.11b/g compliant equipments • Auto data rate switch with 54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps for 11 b/g • External Antenna • System Throughput 16 Mbps	**Management Features** • Web Based Management • Mesh AP Utility Manager • TFTP/HTTP download • SNTP • Event log • System Information • Change Administrator Password • System reboot
Output Power & Range 1) **Mesh AP**: 100mW	**Throughput** 1) One Hop : 13 Mbps 2) Two Hops : 5.4 Mbps 3) Three Hops : 4.2 Mbps 4) Four Hops : 3 Mbps *Depend on the wireless adapter